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Some Stray Thoughts on Clinical Diagnosis.*

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When your Secretary paid me the compliment of asking me to read a paper before you, he suggested that the subject be something of a clinical character, associated with canine work.

As one-half of our work is the diagnosis of disease, and I think we are all agreed it is by far the more important half, the exchange of a few ideas is bound to be of advantage to us. No matter how advanced is one's knowledge of the pathology and treatment of a condition, or how skilful is one's surgery, it is all to no avail if diagnosis is wrong.

First I would like to lay stress upon two important points.

1.—The necessity for making considerable enquiry into the history of the case.

2.—The importance of making a systematic examination of the patient.

The one is the complement of the other, and absence of either serves to make accurate diagnosis practically impossible. The old and familiar joke that the veterinarian is essentially a clever man, in that his patient cannot tell him where the pain is, is not strictly true. It is only by comparing one's findings on examination with the history obtained from the patient's attendant, that one makes up one's mind as to what the trouble is. Owners are usually most eager to give one their own diagnosis and explain the measures of treatment already adopted. Do not pay much attention to these. The history has to be extracted by careful questioning. The subject is an exhaustive one, and these remarks are in no way intended to be complete. They are impressions gained during the course of one's experience.

I propose to speak of a few important symptoms, and to indicate their significance with a view to making a diagnosis.

I.—Laboured Respirations.

A panting dog is a common sight. It is through the agency of respirations that a dog eliminates excessive body heat. Laboured respirations in animals at rest and in normal atmospheric temperatures are significant of a number and variety of diseased conditions.

The first question one asks oneself is: Is there any disease of the lungs themselves? The two most common forms are: catarrhal pneumonia and the presence of neoplasms involving the lung tissue. Pneumonia may occur in animals of all ages, but is far more frequently met in the young, when it is a complication of distemper, in which case diagnosis is comparatively easy. New growths in the lungs are frequently met in animals past middle age. Cancer of the lungs may be primary or it may be the result of metastasis from a growth in another location. In primary cases the onset of respiratory distress is insidious, it is not associated with any rise in temperature, and the appetite remains good. Associated with its growth is an inexplicable but progressive loss of flesh. Auscultation will reveal an absence of normal breath sounds in the affected area, but to my mind percussion of the chest wall particularly well demonstrates the solid nature of the lung. In later stages the growth frequently becomes infected with pyogenic organisms and localised areas of pneumonia occur, with general systemic disturbances. The appetite becomes variable and the temperature fluctuates.

In cases of metastasis the course of the disease is much more rapid and the onset of respiratory distress may be much more sudden. The recent removal of a growth in some other part of the body often serves to indicate what has happened.

In cases of extensive destruction of lung tissue the heart always furnishes valuable information. As a result of the increased work placed upon the right ventricle, dilatation occurs. In the later stages this dilatation becomes, to a degree, compensated by hypertrophy. The heart becomes enlarged, its impulse against the chest wall becomes exaggerated and the pulse accelerated. Auscultation may reveal systolic arythmia and a murmur associated with tricuspid insufficiency. This murmur will not, however, be very marked, and is not to be compared with the murmur we so frequently hear associated with vegetative endocarditis. Venous congestion, in turn, gives rise to some hydrothorax and also congestion of the liver with occasional biliousness and perhaps diarrhœa.

Many of our cases, however, in which the most pronounced symptom is difficult breathing, are not associated with any diseased condition of the lungs. The presence of fluid in the pleural cavities is a common cause. The fluid may be inflammatory exudate, the condition being one of primary pleurisy; or, and as is more frequently the case, it may be transudate, the condition being one of hydrothorax. Occasionally one meets a chylous fluid in the chest.

If the condition is one of acute pleurisy the history of the case will furnish valuable information. Note the comparative suddenness of onset, the vary obvious systemic disturbances, general malaise, loss of appetite, the presence of a febrile temperature. Springing of the ribs will cause pain; percussion of the chest will reveal loss of resonance, and auscultation a complete absence of normal breath sounds.

One must endeavour to satisfy oneself as to the cause. Is it what may be called a case of idiopathic pleurisy

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or is it traumatic? Purulent pleurisy, as the result of perforation of the œsophagus by an obstructed foreign body, is by no means rare. In this latter case a history of continuous vomition helps one. A chronic tuberculous pleurisy may be encountered.

Hydrothorax in the dog is extremely common. Quite recently we have come in contact with a three-year-old collie dog from which half a gallon of water was removed from the chest by means of a trocar and canula.

The presence of transudate in the chest may occur alone, but more frequently it is associated with the presence of fluid in the other great body cavity, the abdomen.

Let us review the causes of œdema, from a clinical aspect.

A. Diseased Conditions of the Heart.—In my opinion, this is the commonest cause of œdema in young animals—and by young I mean animals up to five years of age. Dilatation of the ventricles is common and myocarditis is by no means rare. It causes a diminution in the force of contraction; some dilatation of the ventricles occurs which, in turn, gives rise to some insufficiency of the auriculo-ventricular valves, and the result of these effects is a chronic venous congestion with consequent œdema.

Chronic vegetative endocarditis, a condition so commonly met in aged dogs, particularly those of the toy breeds, does not appear to be a cause of extensive œdema. It does, of course, give rise to symptoms of respiratory distress and I propose to mention it a little later.

Chronic disease of the liver is a cause of extensive œdema, particularly in animals past middle age; so also are extensive cirrhosis, extensive cancer, the presence of the so-called hæmangiomata, or hæmorrhage into the liver substance. The œdema is either direct as the result of portal stasis, or indirect as the result of changes in the left heart. With liver disease alimentary symptoms are predominant, chronic indigestion with frequent vomition; icterus is not uncommon. Palpation is of value here.

The presence of extensive neoplasms associated with the bronchial and mediastinal lymphatic glands, causing pressure on the great veins of the chest, is a cause of hydrothorax.

Chronic nephritis must be regarded as a potential cause of generalised œdema, but clinical experience teaches that dropsy is only an exceptional accompaniment of this very common condition.

In all of the conditions previously mentioned the laboured respirations have been more or less continuous. Let us turn to those conditions in which distress only accompanies exercise, that is, when at rest the animal's breathing is comparatively normal.

I propose to speak only of chronic vegetative endocarditis. The two outstanding symptoms of this disease are, respiratory distress on exercise, and a chronic cough. Such a history should immediately lead one to auscultate the heart. The mere placing of the fingers against the chest wall will indicate hypertrophy and tachycardia.

Auscultation will reveal extensive changes in the mitral valve. The first heart sound, the "lub" sound, is often entirely replaced by a continuous bellows' murmur, and as a result of this the second sound is very difficult to detect. It is not often, however, that the semilunar valves in the aorta and the pulmonary artery are affected; the disease is usually limited to the mitral and a lesser degree the tricuspid valves. The two chief causes of the respiratory distress in this condition are:—Mitral insufficiency causes a damming back of arterial blood on to the lungs at each systolic contraction; tricuspid insufficiency, causing venous blood to be returned to the great veins and not into the lungs during contraction of the right ventricle. One would expect this latter condition to give rise to hydrothorax; such a condition, however, is not common. Œdema, when it does accompany valvular disease of the heart, is usually peripheral, and is consequent upon a fall in the *vis-a-tergo*, due to a fall in blood pressure as a result of the fall in output from the left ventricle.

We cannot leave the subject of difficult breathing without mentioning street accidents. A dog has been knocked down or run over by a motor car and the chief symptom appears to be laboured breathing.

One cannot make a hurried diagnosis. At the time of examination the animal is in pain and is suffering from shock. Careful observation must be kept for hours and even days after such an accident. In many cases the distress is the result of bruising of the ribs and intercostal muscles. Ribs may be fractured and there may be hæmorrhage into a pleural cavity. The pain associated with laceration of the peritoneum may be the cause.

Rupture of the diaphragm may have occurred and there may be hernia of certain of the abdominal organs into the chest.

In many cases nothing of a serious nature has occurred and the animal becomes normal in the course of 24 hours or so. Fractures of the ribs can be felt, whilst auscultation and percussion will reveal extensive hæmorrhage into the chest. Severe injury to the peritoneum is always accompanied by reflex vomition. The animal holds the abdominal muscles tightly and resists palpation.

Rupture of the diaphragm I find extremely difficult to diagnose with certainty. It is a comparatively common sequel to street accidents, but one would hasten to add that every case of laboured breathing, following an accident, is not, of necessity, a rupture of the diaphragm. Mistakes constantly crop up.

Rupture usually occurs through the muscular portion, not infrequently at the œsophageal foramen, and herniated organs usually pass into the right chest. Laboured breathing is due in part to the fact that the diaphragm is out of action and in part to the herniated organs pressing on the chest contents. A herniated stomach may rapidly prove fatal. It becomes rapidly tympanitic and death occurs either from asphyxia or from syncope, the result of pressure on the heart.

As a diagnostic aid, I place the greatest reliance on percussion of the chest wall. In such a case there is great respiratory distress, which is probably becoming worse. The strain upon the heart is indicated by the full bounding pulse. Percussion reveals an entire absence of resonance over the right chest. Palpation of the abdomen, if it can be carried out, reveals an emptiness of this cavity. In such a case a laparotomy should be immediately performed. But here I am touching on treatment, which does not enter the scope of these remarks.

I would like, however, to quote a case which, I consider, demonstrated well the symptoms I have tried to describe.

Case.—A 12 months' old Peke dog. The animal was

examined 24 hours after the accident had occurred and the most marked symptom was that of great respiratory distress. The animal had not eaten since the accident, but had attempted to drink water. Whilst it was obvious that the animal had swallowed the water, in a minute or so it was seen running from the mouth, although no vomition had occurred. The inference was that it had not reached the stomach. Percussion of the right chest revealed an entire loss of resonance.

Laparotomy revealed an extensive diaphragmatic rupture, through which had passed a portion of the liver and the entire stomach, into the right chest. The stomach had become tympanitic, having attained the size of a large orange. With difficulty it was drawn back into the abdominal cavity and out of the abdominal wound. Tympany was relieved with a trocar and canula. It was found impossible to suture the diaphragmatic rent, but it was hoped that, by careful dieting and by restricting movement, adhesions would take place between the diaphagm and the anterior surface of the liver.

The animal lived for 28 days after the operation, during the latter part of which time it was, as far as could be seen, entirely normal. Death occurred during the night. The stomach had again passed forward, had become tympanitic and death occurred from asphyxia.

I feel that we should not leave the subject of respiratory distress without referring to abdominal distension as a cause. In such conditions, the distended abdomen becomes the primary consideration, the laboured breathing being in most cases indirect.

The commonest causes are, ascites (to which I have already referred) and tympany. Both of these conditions are easily recognised, but unless a proper examination is made, a third and extremely common condition, may be overlooked. I refer to pyometra in the bitch, the uterine horns being enormously distended by pus. It is usually encountered in maiden bitches past middle life. The presence of a purulent discharge from the vulva facilitates diagnosis, but it is by no means constant. The cervix often remains closed. In any case the quantity of discharge is never proportional to the enormous amount of pus present in the uterus.

To my mind, abdominal palpation is not of much help, the uterine walls are too thin to be of much tangible aid to diagnosis.

I would like to place much stress upon the importance of a rectal examination in these cases. The normal uterine body is a strikingly small structure. The cervix can be felt under the finger rather like a small pea and from it, passing forward, the uterine body, a flat, firm structure, about ¾-in. in its greatest diameter from side to side. It is comparatively long and it is only in the smallest bitches, those of 15 lbs. and under, that the bifurcation can be felt.

In pyometra, however, and particularly when there is considerable distension, changes in the uterine body can be very easily recognised.

Emaciation.

The second subject upon which I propose to express a few thoughts, is emaciation.

In young animals emaciation is often the result of a protracted course of distemper. The cause is obvious and recovery from the disease is accompanied by a rapid regaining of flesh. (I do not suggest, however, that they all recover.) In young puppies general debility is an accompaniment of the gastro-enteric disturbances associated with dietetic errors after weaning; and also as the result of gross infestation with ascarides.

The cases I have in mind, however, occur in older dogs, usually past middle age. The onset is insidious but the condition is progressive, and we are taxed as to the cause.

It is customary to look to the alimentary canal, and undoubtedly chronic dyspepsia is a frequent cause, but it is by no means the invariable cause. I feel justified in stating that the commonest cause of emaciation in old dogs is chronic disease of the kidneys. We are all perfectly familiar with this condition on *post-mortem* examination; and I would like us all to be equally familiar with the symptoms to which gives rise during life.

The animal, usually a male, has been losing flesh for some months. Its appetite has been variable. There has been occasional sickness, nothing acute, and the sickness appears to bear no relation to the ingestion of food. Vomiting, however, is becoming much more frequent. It has for some time been drinking excessively and urinates copiously. Increased thirst is a constant symptom.

Examination fails to reveal anything very definite. There is no evidence of abdominal or sublumbar pain, and the loss of flesh is obvious. One might mention that wasting of the temporal muscles and sinking of the eyeballs are often seen. It is suggested by some that it is symptomatic of tuberculosis; this is not my experience.

Examination of the heart reveals hypertrophy and often some dilatation of the left ventricle, with a faint systolic murmur. But, dealing with the heart, I wish to state at once that, from a chemical aspect, chronic nephritis does not appear to be connected in any way with chronic endocarditis.

In all such cases an examination of the dog's urine should be made for the presence of protein. Collection is not difficult, as the dog drinks and urinates copiously. It is of low specific gravity and light in colour. The precipitation of albumin by the nitric acid ring test or the sulpho-salicyclic acid test, serves to establish one's diagnosis.

Such cases are frequently diagnosed as gastritis. I agree that the symptoms indicate a chronic gastric disturbance, but would point out that chronic irritation of organs quite remote from the stomach gives rise to vomiting. The reflex irritability of the vomition centre in the dog appears to be highly developed.

A speculative diagnosis " tuberculosis " is often applied to the condition I have described. Whilst the existence of this disease must always be borne in mind, by experience is that it is comparatively rare in the dog. During the past two years, in some 10,000 dog cases we have only been able to demonstrate the tubercle bacillus twice.

Another common cause of progressive emaciation is the presence in one or other of the internal organs of a malignant neoplasm. The incidence of malignant growths in the dog is much higher than in any other of the domestic animals and forms one of the commonest fatal diseases.

I have already referred to cancer of the lungs and in this condition stated that in cases of metastasis, particularly as the result of interference with an active infiltrating

growth, the onset of alarming symptoms may be extremely rapid.

Primary cancer, however, frequently involves an abdominal organ and here the course of the disease is far more insidious. Emaciation is progressive but the appetite remains good. Vomiting and excessive water drinking are not prominent symptoms. The animal slowly fades away. Careful palpation of the abdomen usually reveals the cause of the trouble. Of the organs involved, I would place the abdominal lymphatic glands first, the liver second, and the wall of the stomach and gut third.

I do not suggest that I have exhausted the causes likely to give rise to these two symptoms, but I trust that the few thoughts I have expressed will serve to stimulate even further interest in your patients and thus may we all become more expert in the profession which we have adopted.

Discussion.

The President (Major Duncan) said that he supposed every practising veterinary surgeon knew the extreme difficulty of diagnosis, and he, for one, had learned a good deal from Professor Wright in regard to the necessity of careful attention to detail in this, as in every other, connection.

He was somewhat surprised, however, by one statement, made by Professor Wright towards the end of his remarks, namely, that tuberculosis in the dog was extremely rare, and that out of thousands of cases he had only been able to demonstrate the *Bacillus tuberculosis* in two. That was the opposite of what he thought the essayist would have said, namely, that tuberculosis was extraordinarily common in the house dog. When he (the President) held the position of house surgeon he saw a great many cases of ascites in the dog, which he thought were due to tuberculosis, and since then had seen numerous cases of tuberculosis affecting the livers of dogs and associated during life with ascites.

Major G. W. Dunkin said that, although he was not now a clinician, he was greatly interested in conditions of the heart. He understood Professor Wright to say that in his experience myocarditis was a relatively common condition in the dog and he wanted to ask him if that statement referred to old dogs, because from his limited experience in the relatively young animal it was comparatively rare. Also, what type of myocarditis did the essayist think was most common in the dog., i.e., fragmentative or indurative, and could he give some information as to the extent of the histological changes: he believed they differed considerably in different cases.

In regard to the question of the occurrence of tuberculosis in the dog, in his view both the President and Professor Wright were correct: he was not sure that anyone was justified in saying that from his particular experience tuberculosis was rare or common in the dog, providing his statement was intended to be general, because everyone knew that the extent of tuberculosis in any species—even the human subject—depended largely upon local conditions; therefore, before one described the occurrence of any particular disease in any species of animal as being rare or common, the term must be used in a relative sense, having due regard to the condition existing in the locality concerned.

The Hon. Secretary (Mr. H. Bell) thanked Professor Wright for his very instructive paper, and observed that he was interested to hear his remarks about pyometra in the bitch. He always understood that one was bound to meet with a discharge of pus from the vagina, until quite recently, when he met with a case in which he did not for a long time know what was the matter. The dog was a Sealyham and was showing what he took to be heart symptoms. He never suspected pyometra, but at last, when the animal was on the point of death, there was a copious discharge of pus from the vagina. When he heard of this, he knew at once what was wrong, though, having felt fluid in the abdomen, he had thought it was a dropsical condition. He removed the womb, which he found to contain a quart of pus, and the bitch made a good recovery.

With regard to tuberculosis in the dog, he had a case some time ago, also in a Sealyham, which had been treated for gastritis. The dog made a peculiar retching sound when exercised and drank a lot of water. He at once suspected tuberculosis, for the dog was very anæmic and had been going off in condition for six months. He tested the dog for tuberculosis and by good luck he warned the owner that in so doing they might kill it. He applied the subcutaneous test; the animal's temperature went up to 110° F. and it died. On *post-mortem* he found the dog to be absolutely rotten with tuberculosis.

Concerning the use of X-ray, he was glad to hear Professor Wright say that in their diagnosis they must not forget to make use of the fingers that God gave them.

Captain J. R. Hewer, having expressed his thanks to the essayist, said that he would like to bring to their notice a case he had had under treatment a year or two ago. The subject was a bitch which was constantly retching, especially after feeding. He suspected a needle or wire in the œsophagus, but an X-ray examination disclosed nothing in the throat. After developing the film, however, the operator reported to him that the trouble was due to calculi in the bladder, there being large, dense shadows in this position. A rectal examination disproved this, as also did a later X-ray exposure. These shadows arose from the fact of the dog having been treated with bismuth, and showed, said Captain Hewer, how important it is to study all the facts in these cases. The interesting point about this case was that the vomiting ceased after the exposure to X-rays.

As regards accidents, with special reference to rupture of the diaphragm, a dog which had been run over was brought into his surgery, but had apparently recovered. Twelve months later he came in for residence, to all appearances fit and well. To his horror, one morning, he got a message that the dog was dead. *Post-mortem* showed it had rupture of the diaphragm, with hernia and strangulation, and the rupture must have been attributable to the accident which occurred twelve months previously.

He was very interested in what had been said concerning pus in the womb, and it would be interesting to have Professor Wright's views as regarded operation or gland treatment in that condition.

Mr. J. Willett also expressed his indebtedness to Professor Wright for his informative paper, but said that he was rather disappointed that the essayist had limited his paper to the dog. With regard to symptomatic respiration, there were certain conditions in the horse with which one meets, more especially in light-bred horses that had increased respiration, upon which he would have liked to have heard Professor Wright speak. One was congestion of the liver. When one first saw an animal with this increased respiration in the stable, one thought of pneumonia or congestion of the lungs, but it turned out to be congestion of the liver with resultant constipation. Another phase was seen in race horses, raced hard as two-year-olds. In these one got hypertrophy of the heart—what one would term "athlete's heart"—with increased respiration. That hypertrophy of the heart was met with in horses that had been raced late in the autumn as two-year-olds, horses which were then said to be useless as three-year-olds. As a fact, his experience of such an animal was that it came to hand late in the season, won, and was raced hard. Then it was brought out early the following season and it knew it could not do the journey and did not try. If that animal was rested as a four-year-old the heart became normal again and his early promise would then be fulfilled. The heart of a horse that was hunted when he had gone wrong in his wind would become hypertrophied towards the end of the season.

Those were cases in which they got increased respiration, and he would have liked to have heard Professor Wright's views on that subject. Doubtless, however,

the essayist had to confine his observations to one particular animal, therefore he did not wish to criticise him.

Major Hamilton Kirk observed that Mr. Bell's remarks about the bitch with pyometra reminded him of an unfortunate diagnosis he made a fortnight ago. A fox terrier bitch was brought in for treatment for a chill; the temperature was 103-4° F., and the respirations were moderately accelerated. He thought it was just a cold, and he treated for that. There was no history, and no symptoms of any other kind. About four days after he saw that bitch, the owner 'phoned that she was dead. He thought it extraordinary, and made a *post-mortem*, when pyometra was revealed. Had there been a discharge from the vulva he would have had a clue and would have known what to do; as it was, he made an absolutely wrong diagnosis. The bitch died, of course, from pneumonia, so far as the owner was concerned.

As regarded the treatment of pyometra, some four years ago he first adopted the use of pituitrin—one injection daily—and every case recovered under that treatment. He might have been very lucky, and he did not know how it acted, except that it contracted the womb and tended to drive out the contained pus. He had successfully treated, by this means, two cases in cats and several in bitches.

Major F. J. Taylor stated that he could endorse Major Kirk's opinion as to the value of pituitrin for the treatment of septic metritis in the early stages.

Referring to accelerated respiration and indefinite causes for it, he would be glad to hear Professor Wright's opinion concerning the accelerated breathing with which one met in pseudo-lactation in non-pregnant bitches about 63 days after their menstrual period, with indurated and painful mammary glands distended with milk, elevated temperature, accelerated breathing, frequently very neurotic and sometimes accompanied by tetanic convulsions. He invariably treated them with aspirin, bromo-valerian, or luminal sodium, and menthol and camphor in oil as a local application, and they usually recovered in three to five days.

He advised the young practitioner to beware of this somewhat unusual condition in bitches as a probable cause of accelerated breathing apart from a thoracic cause, which might mislead one into making an error in diagnosis.

The Hon. Secretary said that there was one case which he omitted to mention. His brother and he examined a Labrador bitch, and she had the most profuse discharge of pus from the vulva. They decided to operate on her, but found the womb normal, and they did not know where the pus came from.

Mr. J. Bell observed that his brother did not mention that in that case there was, in point of fact, some septic condition of the womb, but they certainly were in doubt as to whether or not the pus emanated from that organ.

Captain H. B. Collett observed that he had a case of a bull terrier bitch which was drinking a great deal of water and vomiting. He had forgotten whether she died or whether he destroyed her, but on *post-mortem* examination the case disclosed itself as one of pyometra. He questioned the owners, who said that they had never noticed any discharge; therefore it was his opinion, also, that it was not in every case of pyometra that one met with a discharge.

The President (Major A. C. Duncan) said that the paper and discussion should be noted by Professor Wright's own students, because years after one had qualified, as a rule, it was gradually borne in upon one that the most obvious symptoms were not necessarily those from which one should draw one's conclusions. It was only by the most careful examination that one could hope to arrive at any definite conclusions in that most difficult of all tasks, diagnosis.

Some of the speakers had given their experiences, and some of his hearers might have noticed, as he had done, that these experiences had in many cases been unfortunate: the *post-mortem*—(laughter)—revealing something entirely different from what had been diagnosed. Of course, that was perfectly true.

Some criticism had been passed on the application by the practitioner of some of the more recent aids to diagnosis. Their Secretary had said that God gave us hands, but He also gave us X-rays, which the President, for one, was glad to be able to use as an aid to his hands and sometimes he had learned something from their use.

The Reply.

Professor Wright, in reply, thanked the Fellows of the Royal Counties Division for the very kind way in which they had received the few remarks he had made; he felt amply repaid, in view of the stimulating discussion they had produced.

He was well aware that his statement that, in his experience, the comparative incidence of tuberculosis in the dog was rare, would draw forth a lot of dispute. He was simply making a statement of fact—*viz.*, that of about 10,000 dog cases they had only found the tubercle bacillus in two. The tuberculin test had been mentioned. An animal that was showing all the clinical symptoms of tuberculosis was tested by the subcutaneous test and in the next six hours its temperature went up to 106° F. The temperature then came down practically to normal, and the animal died, but on *post-mortem* Dr. Hare found that it was suffering from an extensive neoplasm in the chest, and not from tuberculosis. The outcome of his (Professor Wright's) experiences was that, associated with the train of symptoms he had described, and particularly on finding the urine heavily albuminous, the dog had chronic nephritis—excluding, however, chronic cystitis, which was rather more obvious.

Replying to Major Dunkin, he must say that one would pay more attention to a case of myocarditis than to a case of distemper, because one did not often see a case of myocarditis, but in the Outpatients' Department they had had three cases in the last six months, and they regarded those cases with great interest, handing the heart over to Dr. Hare for examination as to the histological appearance of the lesions. They had one case in a three-year-old collie, and one in an aged wolf hound, while the other was in a seven-year-old whippet.

Concerning Mr. Hewer's remarks, he was not quite happy about those gentlemen who claimed to have secured recovery from metritis by the use of pituitrin: he would like to see the uterus on *post-mortem*. They were constantly coming in contact with metritis at the College, and they used pituitrin extensively, their conclusion being that while it might promote expression of pus it did not cure.

The Hon. Secretary had borne out his (the speaker's) own unfortunate experiences: it was as a result of his errors associated with chronic metritis that he was led to examine suspicious cases *per rectum*. He agreed that this was an objectionable practice, but he did it many times and he now knew, as the result, what the dog's normal uterus was like: it was a strikingly small structure. In that connection, he had read about the foreigners who dilated the cervix in the dog and introduced iodine vapour: he did not believe it. (Laughter). The cervix of a 90-lb. dog was about the size of a lentil. In a metritis case one could recognise a dilatation immediately in front of the cervix; one could say that under one's finger there was not a normal uterine body. Abdominal palpation was worth nothing; the uterine musculature was so thin that it offered nothing to the fingers.

In answer to Mr. J. Willett, he had confined his remarks to the dog as the result of the wording of the invitation he received from the Secretary, but he quite agreed that congestion of the liver would cause increased respiration in the horse. Regarding Major Taylor's bitches with phantom pregnancy, he did not know about toxic absorption from the mammary gland: he did not know what the toxins were, or why there should be any toxins there. One must remember that the bitch was going through a peculiar hormone change, and it was quite conceivable that some respiratory abnormalities were a reaction from some hormone activities.

Undulant Fever.*

By Alice C. Evans.
National Institute of Health, Washington D.C.

[As our readers know, it was Dr. Evans' fundamental discovery, in 1917, of the resemblance of the causal organisms of the two diseases which disclosed for the first time, rather surprisingly, the relationship between the human disease and contagious abortion of cattle.—Ed., *V.R.*]

Five years ago undulant fever was rarely recognised in this country, but now it is a fairly common disease. That does not mean that it is spreading at an alarming rate. Probably there are no more cases to-day than there were five years ago, but doctors have learned to recognise the disease. The events which led to its recognition may be related briefly.

Undulant fever became known as a disease during the Crimean War when many soldiers sickened with a prolonged fever which differed from typhoid. Later, it was recognised as a common disease in Mediterranean countries, and for many years it was supposed to be almost limited to that region. Hence it was called Mediterranean, or Malta, fever. Although it is now recognised all over the world, it is probably more prevalent in Mediterranean countries than anywhere else.

In 1886 a young English medical officer by the name of David Bruce (he is now Sir David) was ordered to the garrison on the Island of Malta. He took with him his young bride who became a valuable aid in his research work. Being of an investigative nature, interested in bacteriology, he spent his spare moments studying the cause of the prolonged fever which disabled so many of the soldiers in Malta. From the spleen of a fatal case he cultivated the causal organism, a small bacterium which he called *Micrococcus melitensis*, micrococcus meaning a minute spherical body.

The next important event in the history of undulant fever occurred about ten years later. (Most of the important events in the history of undulant fever have occurred at approximately ten year intervals). In 1897 a Danish investigator by the name of Bang announced that he had discovered the cause of contagious abortion, a widespread disease in cattle. Neither Dr. Bang nor anyone else suspected that his discovery was of interest to human medicine. It was about thirty years after this discovery before its significance to human medicine became apparent. When Bang examined under his microscope the bacteria which he had found to be the cause of contagious abortion in cattle, he saw minute rod-shaped bodies. He called the organism *Bacillus abortus*, the name bacillus meaning a rod.

Almost another decade rolled around after Bang's discovery before the next step was taken in the knowledge of undulant fever. British army officials wanted to find out means to prevent the high incidence of undulant fever in their troops stationed in Malta. For this purpose they sent a group of investigators to that island headed by Bruce. The reports of this Royal Commission announced two fundamental facts concerning undulant fever in Malta: First, that the chief source of human infection is goats, which may excrete the causal organism in their milk, although they appear healthy; second, that people may live in Malta without contracting the fever if they avoid raw milk.

Thus the status of knowledge on undulant fever remained for another decade, and it was then, in 1917, that I had an opportunity to make an observation which led (after about another decade) to the recognition of undulant fevers in countries all over the world where cattle are the milch animals. The task had been assigned to me to study the bacteria which are present in cow's milk when it is drawn, coming from the inside of the udders of healthy cattle. Among other bacteria I found Bang's bacillus in the milk, as others had before me. It did not seem to me nice to think that this organism, which can cause contagious abortion in cattle, is present in much of our raw milk. I wanted to know more about it, so I compared it with this and that bacterial species, among others the *Micrococcus melitensis* of Bruce, because that, too, was known to be excreted from the udders of another species of milch animal, the goat.

It may be conjectured that the reason these two organisms had never been compared before was on account of their conflicting names. If Bruce's organism was spherical, and Bang's was rod-shaped, the early bacteriologists would have thought it heresy to consider a possible relationship between them. The science of bacteriology is still young, and there are many things yet to be learned.

It was a great surprise to me to find that Bruce's micrococcus and Bang's bacillus are so nearly alike that ordinary laboratory tests cannot differentiate them, although, as further study revealed, they can be differentiated by the intricate agglutinin absorption test. Why, then, did we not have undulant fever in this country? It was five years before that question was answered; we do have it. In 1922 a case of undulant fever caused by the *abortus* type of the organism was recognised in the John Hopkins Hospital in Baltimore. It was the first proved human case of *abortus* infection ever to be reported in the world's literature on undulant fever. Soon afterwards a report came from South Africa, followed by reports from various far corners of the world, stating that undulant fever is contracted from cattle.

Hogs also are infected with contagious abortion, and for some unknown reason the swine strains of *abortus* are more virulent for man than are the cattle strains. The organism seems to be able to gain entrance into the body more readily through the skin, particularly through abraded skin, than through the digestive tract. Hence the farmers, veterinarians, and workers in slaughter houses who have to handle infected animals are particularly susceptible to infection.

Many cases of undulant fever are contracted by drinking raw milk, but fortunately children seem to possess an immunity. Since they are the greatest milk drinkers the disease would be expected to be most common in them if it were not for this natural immunity. Few of the reported cases have been in children.

For the protection of milk consumers the preventive measure is quite obviously the same as that practised for

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the prevention of other infectious diseases that are spread by milk, namely, pasteurization. Those who are able to pay the price for certified milk may take raw milk with a reasonable degree of safety, if the certification guarantees that the milk is from an abortion-free herd. No milk other than that so certified, or pasteurized milk, can be considered safe, for the cattle disease is wide-spread everywhere in the United States. It is fortunate that the preventive measure of pasteurization is so easily available.

It is now about eight years since the first case of undulant fever due to *abortus* infection was recognised in this country. For the next three or four years only a few cases in gradually increasing numbers were recognised in several centres where research in this disease was being conducted. Then, to round out the decade intervals of important events in the history of this disease, 1927 is distinguished as the year when the physicians of this country began to be aware that undulant fever should be considered as a possibility in every case of fever of undetermined origin. In that year, 217 cases were reported. By the next year the information about the disease was more widely disseminated, and 649 cases were reported. In 1929, the reported cases numbered 1,301, some in every state in the union.

The rapidly increasing numbers of reported cases signifies nothing more than that physicians are learning to recognise the disease. It is interesting to speculate for how many more years the figures will continue to multiply. In other words, what fraction of the actual total of human cases of *abortus* infection in this country does the figure 1,301 represent? Several considerations may be offered. In the first place many cases that are recognised are not reported because the law does not require it. Probably most of the acute cases which enter the large hospitals are now properly diagnosed, and this may be true in the country districts of some states where a campaign of education on undulant fever has been carried on for several years. But in some states there has been little attention paid to it, and there must be many undiagnosed cases occurring on the farms, where raw milk is used as a rule. Further, there is one type of case, the ambulatory case with chronic infection, which is not yet being recognised. No one knows how many cases there may be in this country.

The nature of undulant fever explains the difficulty of diagnosis. There is a manifold variety of symptoms, sometimes simulating one disease and again another. The only suggestive characteristic is the wave-like temperature curve, a single wave covering a number of days or sometimes several weeks. Not all cases, however, give this undulating temperature curve. Cases with high fever have been suspected to be typhoid and when the Widal test failed to confirm the diagnosis they were called atypical typhoid fever. In cases in which chest symptoms were prominent, the patients were sent to a tuberculosis sanatorium. In some cases joint pains are the most conspicuous symptom. In such cases the diagnosis was arthritis. Thus the lack of characteristic clinical signs in undulant fever accounts for the errors of diagnosis. If, however, the physician is "undulant fever-minded," he will have serological tests made. In most of the acute cases the results are definite, but in many of the chronic ambulatory type of cases the serological test gives negative results. With a half-sick patient giving no clinical evidences of disease, and negative serological tests, the diagnosis of neurasthenia is almost inevitable. It is a severe blow for a patient whose spirits are already depressed by continued ill-health. In the progress of undulant fever investigations perhaps the most urgent need is a test which will aid in the diagnosis of the chronic type of case.

The patient with a prolonged undulant fever infection is under a severe trial. The painful symptoms come and go in waves like the temperature curve, and hope and discouragement alternate with the waves. Robert Louis Stevenson expressed very well the great trial of the frequent rise and fall of hopes. He wrote:

> Resignation may follow after a reasonable time upon despair; but if a man is persecuted by a series of brief and irritating hopes, his mind no more attains to a settled frame of resolution than his eye would grow familiar with a night of thunder and lightning.

There is no cure for undulant fever. The defence mechanisms of the patient must fight the battle alone. Sometimes that battle is won in a few weeks; more often it requires several months; but sometimes it requires years. Four or five per cent. of cases are fatal. The only aid which can be given by doctors and nurses is symptomatic treatment. The benefits of such treatment will be best realised if it can be given with a sympathetic understanding of the disease.

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British Zoologists.

At the annual meeting of the Association of British Zoologists on Saturday last in the rooms of the Zoological Society of London, with Professor E. B. Poulton, F.R.S., in the chair, the morning session was devoted to discussions whether zoologists should accept fees for lectures and expert advice, and on the future of zoological collecting. In the afternoon the members considered a motion "that training for applied zoology must be based upon a broad, general zoological foundation." Dr. W. T. Calman, F.R.S., dealt with museum work, Dr. E. S. Russell with fisheries work, and Professor J. W. Munro with entomological work. The association has only recently been formed, and this was its first meeting, although for seven years previously there has been an annual meeting of British zoologists to discuss matters of interest to the science.

Eleventh International Veterinary Congress, London,

August, 1930.

Abridged Papers.

(*Continued from page* 39.)

Fowl Typhoid and Bacillary White Diarrhœa.

By Captain J. P. Rice, b.sc., m.r.c.v.s.
Head of Animal Diseases Division, Ministry of Agriculture, Government of Northern Ireland.

In view of the many points of resemblance between fowl typhoid and bacillary white diarrhœa, it is suggested that they should be regarded as merely different forms of the same disease.

The confusion which exists regarding the fermentation reaction of *B. pullorum* and *B. sanguinarium* is due to the lack of a uniform method of testing. In rich media these organisms give reactions which approximate very closely. The conditions under which their carbohydrate-splitting powers should be tested and the reactions which should be regarded as typical are stated.

The main part of the paper is devoted to the diagnosis of pullorum disease in adult birds. The intradermal test is less accurate than the agglutination test, which stands out prominently as the only means of eradicating the disease. The weaknesses of the agglutination test disclosed under laboratory conditions have led certain workers to advise the poultry industry against its use. Pullorum disease is to be allowed to spread unchecked. Such a suggestion cannot be entertained. The value of any test is to be finally judged by the practical results obtained on the farm and not by inaccuracies revealed in the laboratory. There is no doubt that the agglutination test has succeeded in the vast majority of cases.

The author points out the discrepancies in reports from different laboratories on the same samples and urges the necessity for a standard test.

The best time for testing would appear to be about two months after the birds have started to lay. Starvation of poultry prior to sampling is not favoured as it affects the egg yield and is apt to make the test unpopular.

Cloudy reactions can be avoided to a considerable extent by cleanliness in collecting the samples. The first essential to an accurate test is a clean sample.

The evidence is that live bacilli in normal salt solution give the most sensitive antigen and that the addition of chemicals interferes with agglutination, though not to a marked extent. When samples are collected without prior starvation of the birds and the blood is allowed to run over the skin into the tube, as is usually done, there is no objection to the precaution of either increasing the amount of salt in the antigen or of adding formalin or phenol and sodium hydrate.

The chief difficulty lies in the interpretation of the reactions. The test should err on the side of safety, favouring the flock as a whole and not individual birds. This means close reading in low dilutions. It is proposed that any degree of agglutination in a dilution of 1 in 25 should be held to be a positive reaction.

Attention is invited to the loose manner in which flocks are described as " accredited " and " blood-tested " and a plea is made for revision of the nomenclature.

The problem of pullorum disease is the problem of an industry striving to compensate for its gigantic losses by greater mass production of chicks. The size of the unit should vary inversely with the proportion of " carriers " in the flock. This means that on a particular farm, the unit may be enlarged as testing progresses.

Finally, the author urges that the campaign against pullorum disease is as much a matter of teaching farmers the elements of hygiene as it is of applying specific measures.

J. P. R.

Fowl Typhoid and Bacillary White Diarrhœa.

By F. R. Beaudette.
Poultry Pathologist, New Jersey Agricultural Experiment Station, New Brunswick, New Jersey, U.S.A.

Although fowl typhoid and bacillary white diarrhœa have many features in common, they are nevertheless clinical entities. Their causal organisms can be differentiated on the basis of carbohydrate fermentation.

The author cites cases which, in his view, demonstrate conclusively that fowl typhoid attacks baby chicks, that adult hens occasionally have localised ovarian infection and that transmission of infection may occasionally take place through the egg. He finds himself in a position to construct a cycle of infection to parallel that in the case of pullorum disease.

It appears that carriers constitute the most important means by which fowl typhoid infection is carried over from outbreak to outbreak, for the reason that the organism does not seem to remain viable in soil for long periods. The results of viability experiments on different soils are given.

The author in his review of various methods of detecting adult carriers of pullorum disease states that a number of investigators have not found the intradermal test as valuable as the agglutination test. The so-called rapid method of testing is quite accurate but fails to detect borderline cases. Regarding the use of whole blood instead of serum for the agglutination test, it may be predicted that this test will be found to be less accurate than the rapid method because of the increased difficulty of reading the reaction.

The method of testing employed by the author is described in detail and should be read in the original. A single tube test of a 1 in 60 dilution is used.

A flock may be tested once or twice a year as the owner wishes and the disease is considered eradicated after two consecutive negative tests. In the State of New Jersey the term accredited is used to indicate a flock which is free or from which the disease has been eradicated. Accredited flocks are tested every two years, unless additions are made from the outside. The owner of an accredited flock is not permitted to hatch eggs from outside sources, nor is he allowed to have his eggs hatched by another poultryman.

Repeated annual testing reduces the carrier rate on the average of about one-half each year, until finally the

disease is completely eradicated. Except in the case of valuable breeding birds, one should not attempt to clean up a flock which shows a high percentage of reactors on the original test. Under these conditions, the poultryman will do better by disposing of his flock and starting another with hatching eggs or chicks from an accredited flock.

A standard agglutination test has been agreed on amongst the laboratories in New England and surrounding States, strains of *B. pullorum* from each laboratory being pooled to make the antigen.

J. P. R.

Fowl Typhoid and Bacillary White Diarrhœa.

By Professor Dr. R. Mannınger.
Professor an der Kgl. Ung. Tierärztlichen Hochschule, Direktor des Staatlichen Veterinärhygienischen Institutes, Budapest.

Although in North America Rettger and a great number of other research workers have explained the nature of bacillary white diarrhœa, the manner of its spread, and the methods of its control from 1900, two decades passed before attention was paid in Europe to this interesting disease, important not only from the scientific point of view but also on account of its economic significance. It is wrong to suppose that the disease was introduced with imported North American poultry. It is well known that this disease and the etiologically closely related fowl typhoid were discovered in Europe in 1889, and well-established enzootics of it were diagnosed in small peasant poultry farms in Hungary in 1921, in which case the question of importation of disease from North America did not arise. Therefore bacillary white diarrhœa and fowl typhoid should be regarded as endogenous European diseases, although one cannot deny that in the last few years much infection has originated from imported American produce.

Both diseases are of considerable importance to the owners of large poultry farms and to the small keeper.

Causal organisms responsible for these devastating diseases of poultry are *Bacterium gallinarum* Klein and *Bacterium pullorum* Rettger. There is not the slightest doubt as to the primary etiological part played by the former, which is a species quite distinct from the Pasteurella group. With regard to the relationship existing between the causal organisms of bacillary white diarrhœa and fowl typhoid, there is no such unanimity of opinion. Only recently an opinion prevailed that both micro-organisms were not identical. Unitarian opinion, however, has become prevalent to-day, and many leading research workers in England, U.S.A., Germany, etc., based it upon bacteriological, serological and epizootiological observations. It is recognised to-day that *B. pullorum*, although not being a distinct species, may be regarded as a non-constant strain of *B. gallinarum* [*Bacterium gallinarum* var. *pullorum*]. Fowl typhoid and bacillary white diarrhœa are, therefore, two distinct manifestations of an etiologically identical disease, the differences of the clinical picture being due to the variations in the age of birds affected. Epizootiological observations are not at variance with the bacteriological findings, because it may be assumed that losses among adult birds are, in the majority of cases, due to the morbid processes acquired during young age, and, but in the minority of cases, are caused by an infection acquired in the adult stage.

A number of contributory causes play a part in the origin and spread of bacillary white diarrhœa.

The more numerous become the chances of infection the greater the susceptibility of exposed animals increases. Lack of cleanliness, overcrowding, neglect to separate sick chicks, cold, unsuitable feeding, long transportation of day-old chicks, are but a few of these.

One of the most important sources of infection is the ovary of breeding hens. According to Hof, the causal micro-organism is found in about three per cent. of apparently healthy birds.

In a flock a smaller or lesser number of chicks becomes affected in accordance with the possibilities of infection or the degree of susceptibility of chicks. The more infected eggs there are in the incubator or under the brood-hen the greater are the chances of an outbreak of disease in a hatch. One may say that the number of infected eggs depends on the number of hens with infected ovaries in a flock, *i.e.*, those with the positive blood reaction. According to the author's experience the disease might make its appearance among chicks in a flock where the number of blood-positive laying hens is at least five, exceeding, in proportion to the total number of birds, two per cent; if the number of infected hens is from one to three, being a maximum of 1·5 per cent. of the flock, bacillary white diarrhœa does not necessarily break out. Infected laying hens, however, do not always produce contaminated eggs; therefore the incidence of bacillary white diarrhœa depends on whether these eggs are incubated, and whether the chicks ever hatch out from those. Even then the breeder can eradicate the disease, if he, with but an elementary knowledge of its nature, destroys all ailing chicks and properly cleanses all runs. These facts explain why bacillary white diarrhœa, in spite of the use of eggs of similar origin, either does not occur, or, owing to different circumstances, breaks out, and why it is less known in small peasant holdings than in great industrial poultry establishments.

It is generally assumed to-day that fowl typhoid and bacillary white diarrhœa are two different diseases. It was shown above that, bacteriologically speaking, this differentiation is not justified. Certain epizootiological facts were advanced in support of that idea: reports of the outbreaks in which both hens and chicks are attacked by *B. gallinarum* are relatively scanty. It is, however, overlooked that in recent times, with the growth in importance of the poultry industry, many scientists have reported on the simultaneous outbreaks of two diseases in one form.

The author is of the opinion that, as far as fowl typhoid is concerned, the infection originates, in the majority of cases, in the young chick. One deals in such cases with the pathological changes in the organs of a chronic character, which lead, as such, to death, resulting from rupture of the liver, spleen, or the ovarian follicles, or as a result of acute septic disease. Very often the latter appears suddenly in the course of a chronic infection. Some outside unfavourable influences, such as prolonged transportation, chills contracted during the rainy weather, and sudden change of food, might initiate a septic generalised attack. It depends on the natural resistance of the individual bird, whether these unfavourable conditions produce a fatal outbreak sooner or later. According to American

authors, Doyle, and others, 70 to 80 per cent. of animals affected by fowl typhoid were first infected when they had bacillary white diarrhœa as chicks.

The possibility of infection being introduced in an adult stage is not precluded; contact infection from a grown bird to another grown up bird should be considered of paramount importance in this connection. However, Hof was able to demonstrate that bacilli were present in the fæces of blood-positive hens (otherwise healthy) in three per cent. of cases; on the other hand, Nusshag and Ansorg were able to demonstrate *B. gallinarum* in 25 per cent. of cases of clinically-affected birds. From the epizootiological point of view, it is of importance that laying hens can secrete causal organisms in their eggs.

To ensure correct diagnosis, the veterinary surgeon should be in a position to obtain the services of an experienced bacteriologist, in order to check any *post-mortem* findings. From the point of view of autopsy, the characteristic necrotic changes found in the lungs, also in the heart muscle, in the liver, and in the spleen, might be of diagnostic value. However, similar changes might occur in paratyphoid and in coccidiosis. Both in chicks and in adult animals, diagnosis is ensured by bacteriological investigation. Fowl typhoid might be differentiated from fowl cholera and fowl plague by the fact that in these diseases enlargement of the spleen is absent. It is much more difficult to differentiate fowl typhoid from tuberculosis, spirochætosis, paratyphoid and pseudo-tuberculosis.

No results whatever towards the control of the disease can be obtained by the use of biological products; moreover, the injection of vaccines renders blood-testing for a certain period unfeasible. A very efficient method of control consists, apart from the strict observation of general hygienic measures, in careful elimination and killing of the reactors. From the methods recommended for the detection of the infected animals, the allergic test with "pullorin" cannot be regarded, at present, as a method securing reliable results. On the other hand, the agglutination test, if performed with due consideration to some sources of possible failures, yields quite satisfactory results. Failures are partly of a technical nature, and may partly be due to the quantitative variation of antibodies in the blood of infected animals. For this special reason a prompt and reliable eradication of the disease from a flock largely depends on repeated blood-testing.

At the present time it seems unnecessary to schedule fowl typhoid and bacillary white diarrhœa among notifiable diseases; it would, however, be advantageous to establish a uniform State organisation for combating this epizootic, in order to reduce its incidence. In this respect the establishment of a State supervision, extended free of charge to any farm, providing the owners would subject their flocks to the sanitary measures as proposed by the veterinary officials, seems to be advisable.

H. F.

Nothing in connection with milk production and distribution stands in greater need of revision than the Milk Designations Order. The absurdity of making it compulsory that the third grade of milk should be designated Grade A is patent to everybody but Government officials. They hug the illusion that this way of grading is an inducement to producers to go ahead and improve the quality, alike in respect of cleanness and butter fat.—*Scottish Farmer.*

Fowl Typhoid and Bacillary White Diarrhœa.

By Professor Dr. L. Panisset.
Ecole Nationale Vétérinaire d'Alfort, Alfort (Seine), France.

I.—Bacillary White Diarrhœa.

History.—Geographical distribution. Since its description in 1900 by Rettger, bacillary white diarrhœa, unknown till this time, has spread to the U.S.A. and become the most important disease of poultry. The malady progressed rapidly in Europe and where intensive aviculture had modified old methods of poultry farming, did great damage.

The birds affected are chicks, sparrows and turkeys.

Bacteriology.—Bacterium pullorum (*Salmonella pullorum*) is the specific agent which determines the malady. It is an aerobic bacterium, immobile, with well rounded ends, staining with most dyes, Gram negative and gives no spores on solid media. *B. pullorum* develops colonies which usually are isolated, in the form of straight or curved rods isolated or in twos, united end to end.

In gelatine there is abundant development without liquefaction of the medium; in stab culture little colonies form along the puncture; on potato a layer uncolored, bright, or dark brown; in broth there is abundant cloudy development. Milk is not coagulated.

B. pullorum changes glucose, mannite and levulose, with or without gas formation.

The property of sugar fermentation can disappear with passages or appear in the course of passages.

The study of various strains of *B pullorum* permits one to distinguish a *pullorum A*, which in fermenting various carbohydrates produces gas and a *pullorum B*, which gives no gas; *pullorum A* is the agent of infection of chickens and *pullorum B* is found in adults.

The character is uncertain and it cannot be used to differentiate *B. pullorum* from *B. gallinarum*, the cause of fowl typhoid.

The study of the action of the microbes on sugars has allowed several intermediary strains to be distinguished, but the differences which separate the types are slight, and great importance cannot be attached to them.

The question of the relation of *B. pullorum* and of *B. gallinarum* alone merits attention. The most important distinguishing feature is that, while both ferment glucose, arabinose, levulose and mannite, in the case of *B. pullorum* this fermentation is attended by gas formation but in that of *B. gallinarum* no gas is developed.

For the differentiation of the germs one may also employ special media like that of bromothymol blue. The mixture is composed of agar at 2 per cent., to which is added dextrine (1 per cent.) maltose (0·5 per cent.) and alcoholic solution of bromothymol of ·4 per cent. strength (1·5 per cent.). Sowing is done on the surface and by stab to the depth. *B. pullorum* produces no change; *B. gallinarum* gives a blue colour in the upper part of the tube and yellow in the deep part. Agglutination reactions are not of use to differentiate *B. pullorum* from *B. gallinarum*.

The toxicity of filtrates of cultures varies with the samples, there is a single toxin for *B. pullorum* and *B. gallinarum*. Certain characters of *B. pullorum* and of *B. gallinarum* associate them with typhoid and para-

typhoid bacilli, and Truche classifies them under the typhoid group. Though the bacteriological differences between *B. pullorum* and *B. gallinarum* are slight and inconstant, yet there exist epidemological differences between their infections which lead to their recognition as two morbid entities.

Fowl typhoid is rare in well-managed poultry farms, yet bacillary white diarrhœa may exist there. In the same country the area of diffusion of the infection of *B. pullorum* is much more extensive than that of infection by *B. gallinarum*. Confusion is not lessened since Beach and Davis showed in 1927 that *B. gallinarum* as well as *B. pullorum* may give rise to mass mortality in chicks and to classic infection of the ovary in fowls.

It may be admitted that the two microbian types are varieties of a single microbian species capable of differing and establishing themselves in conditions unknown to us.

Clinical Study.

Principal Symptom.—Diarrhœa, the excrement being fluid and frequent. Colour at first yellow, then greenish, finally grey and whitish. The subjects are depressed, sluggish and do not follow the mother, but stay in a corner and die there. The duration of the malady is variable but usually two or three days.

The lesions seen at the autopsy of a case of bacillary white diarrhœa are little characteristic, except one, which rarely makes default—friability and hypertrophy of the liver. The weight of the organ may reach 250-350 grams. (Truche). Other lesions are very slight, intestinal congestion with hæmorrhagic plaques and swelling of the spleen. Truche and Bauche remarked the existence of little nodules on the lungs situated between the ribs; these nodules suggest chronicity; some contain giant cells. Infected adult fowls may exhibit no signs of the malady which, in them, can only be revealed by sero-diagnostic methods. They may sometimes show signs of infection of the oviduct. Others die, wasted and anæmic, sometimes dying in great numbers with symptoms of fowl typhoid, but at the autopsy signs of infection by *B. pullorum* are seen (anomalies of the ovary, peritonitis, salpingitis, areas of inflammation of the myocardium).

Diagnosis through the autopsy will be directed by evidence of infection; friability and hypertrophy of the liver, persistent caseous yolk (though not specific), areas of myocarditis, characteristic pulmonary lesions.

Demonstration of *B. pullorum* assures the diagnosis. Not content with examining the blood, one makes cultures from liver, yolk and bone marrow. The addition to solid medium or to broth of ox liver of 1 per cent. of brilliant green, facilitates the isolation in preventing invasion by saprophytes. Identification of the germ is assured by its action on sugars. A microbe fermenting dextrose, lactose, maltose and saccharose may be considered *B. pullorum*.

Diagnosis in the case of infected fowls is made by sero-diagnosis, or by reaction to pullorin (extract of cultures of *B. pullorum*). Winter is most suitable for examining the agglutinating power of the blood. The variations of this power are great and some breeders deny the value of sero-diagnosis for purposes of eradication of the disease. Errors can reach 50 per cent. Soda at ·04 per cent. is added to the antigen to avoid the cloudiness that hinders the reading of the results. Rapid agglutination on a slide permits the examination of numerous samples. Injection of 1/10th c.c. pullorin into the wattle may be used; diagnostically it is less valuable than sero-diagnosis, but it may be employed as an aid to that test.

Modes of Contagion.

Especially from infected eggs, those laid by fowls apparently healthy but carrying the germs of the malady in the ovary.

This infection of the ovary diminishes the fertility of the eggs: infected hen, 57 per cent. eggs fertile; non-infected, 90·4 eggs fertile. Chicks born infected contaminate others. Chicks of three days are very susceptible to infection by the digestive tract. Most affected chicks die and those which resist are carriers. Infected eggs are often abnormal and, if eaten by healthy fowls, may infect them.

Non-fertile infected brooded eggs, if given uncooked, are dangerous for fowls and chicks and *for rabbits*.

A possible way of infection is by the cloaca, when the hen sits on a contaminated nest.

Brooders having hot air systems favour contagion, as the dust of dry excrement is carried to chick and eggs.

Brooders receiving eggs from all parts and giving out day-old chicks contribute to the diffusion of the malady. Carrier fowls (positive to sero-diagnosis) are not dangerous to healthy fowls.

Immunisation and Treatment of Bacillary White Diarrhœa.

It was hoped to give assistance to chicks by vaccination of fowls, but so far results are unfavourable. The attempts to protect chicks by the bacteriophage have been attended by variable results. In view of the rapidity of the evolution of the malady, medicinal treatment offers little hope.

Prevention.

Hygienic management is of prime importance and effective disinfection of localities should be associated with it.

Sour milk, whey and other milk preparations have a certain preventive action.

The best weapon against bacillary white diarrhœa is the elimination of the carriers and there are two methods available for their detection—sero-diagnosis and injection of pullorin.

Sero-diagnosis requires the collection of blood and recourse to a laboratory; it must be practised on all the flock; it is lengthy, difficult, and costly, whatever may be its real value.

Pullorination (injection of pullorin) is more simple. It can be practised by the veterinarian or by the proprietor himself, but its indications are less exact, due to the difficulty of interpreting some reactions and to the fact that some infected subjects fail to react. The advantages and indications of the two processes may be associated when one employs first pullorination and disposal of all reactors, then tests by sero-diagnosis those giving a doubtful reaction.

By employing auto-pullorin and testing by it three times a year, sero-diagnosis is not needed.

To assure prevention by pullorination doubtful as well as positive reactors should be sacrificed. Sero-diagnosis for detecting the infected is preferable to pullorination if one adopts a process simple, practical, capable of eliminating difficulties and errors of interpretation, but it is best to associate the two proceedings.

Test twice with pullorin at two or three months' interval, and dispose of the reactors.

On collecting the eggs for hatching, test a large number of fowls which gave no reaction to pullorin by the sero-diagnostic method and keep only the non-reactors as brooding hens: one thus obtains a lot of laying hens probably free from infection with the specific microbe.

Preventive rules can be codified for the constitution of accredited poultry farms such as obtain in Pennsylvania. An accredited poultry farm is one in which the sero-agglutination test carried out twice at intervals of six months at the minimum and one year maximum, yields no infected subject. The same qualification is granted to a poultry farm managed under proper sanitary conditions which has been supplied with its eggs, chicks and adult birds from a duly-accredited poultry farm.

On an accredited poultry farm, sero-reactions are carried out by the Bureau of Animal Industry at least once a year when necessary. Reactors are isolated and sacrificed within two weeks and the localities disinfected. A certificate, valid for a year, is given to each proprietor of an accredited poultry farm. The Bureau publishes yearly a list of farms declared free from the malady. In disease-free farms birds and eggs to hatch may be introduced from non-infected farms. Birds from non-accredited farms for admission must be negative to two proofs. Hatcheries are to be disinfected frequently, if possible between each hatching. Disinfection is best done with formalin. A damp atmosphere in the hatchery limits infection.

Transmission to Man.

B. pullorum is related to agents of alimentary infections, so that the flesh of subjects and infected eggs may be dangerous even after cooking. However, danger to man has never been proved.

. . . . . .

II.—Fowl Typhoid.

Although avian typhoid was described by Klein in 1888, it is only during the past 20 years that the malady has spread widely in France—South of the Loire, the Alps and Pyrenees and occasionally in other areas, and only since the War has it been epizootic there. It is now world-wide and the cause of great losses.

Bacteriology of Avian Typhoid.

In the blood, spleen and liver of subjects is found the agent of the infection—*B. gallinarum*—in the form of a little rod, straight, and with rounded ends, measuring 1 to 2μ by ·3 to ·5μ. In culture the aspect is more variable, often shuttle-like, with a clear space. Cultures grow rapidly, being evident in five or six hours.

In most cases cultures have a peculiar odour, recalling that given by *paratyphoid B.* On agar, the rod is sometimes curved; thicker than specimens found in the blood; isolated, rarely paired; in old cultures involution forms occur—long, filamentous, with swollen ends. The culture on agar is rapid and abundant. In stroke culture a whitish streak forms—creamy. Isolated colonies are slightly raised, diameter 2 mm., white, opaque.

The bacillus is immobile. It takes most aniline colours and is Gram negative. It is ærobic and anærobic. Optimum growth at 30-37 C., but extreme limits of growth 4-45 C.

It is killed by heat at 55 C. in 20 minutes, at 60 C. in 10 minutes and at 100 C. in five minutes.

For the action of *B. gallinarum* on sugars and for its agglutination reactions, it should be compared with *B. pullorum.*

Species Affected.

Susceptible to infection are fowl, duck, goose and turkey, and, in less degree, the pigeon. The pheasant, swan, grouse, sparrow, woodpigeon, flamingo and birds of menageries, including the ostrich, are liable to infection. The rabbit and white mouse are irregularly sensible to subcutaneous inoculation of 1 c.c. of 24-hour culture. The guinea-pig resists subcutaneous inoculation, but dies after strong doses given intraperitoneally.

Clinical Study of Avian Typhoid.

Typhoid affects adults, the symptoms being very vague, especially at its onset, and marked only by dejection and inappetence, then perhaps by diarrhœa. Temperature is raised one or two degrees; the feathers stand out, the wings droop and the gait is staggering. Towards the end there is weakness, profuse diarrhœa, hypothermia and death.

The duration of the malady is from 9 to 12 or even to 20 days. Many recover, more on some farms than on neighbouring ones. Chickens just hatched take the affection. Lesions are little marked and none are specific.

Diagnosis of Fowl Typhoid.

Relative slowness of evolution, decoloration of the comb, and the predominance of the malady in fowls rather than in other farm birds are only uncertain elements for referring the malady rather to typhoid than to cholera. The bacteriological diagnosis alone gives certainty. The specific agent is looked for in the marrow of the long bones. Instead of sending a carcass to the laboratory, a foot separated at the tibio-tarsal articulation is forwarded. Its cultural characters in bouillon and on solid media, absence of indol in peptonised water, permit the identification of the bacterium of avian typhoid. Diagnosis is assured by intradermic inoculation of an extract of the culture of *B. gallinarum.* This process detects carriers which perpetuate the disease.

Modes of Contagion of Avian Typhoid.

Contagion occurs probably by the digestive route, particularly through the ingestion of food, soiled by virulent dejections. The disease is seen throughout the year, but in France it is more frequent in summer. A frequent cause of the propagation of fowl typhoid is the holding of poultry exhibitions. The importation of new races, the introduction of new subjects coming from infected areas, the personnel, fairs and markets are favourable conditions for its transmission. Transmission by the egg is possible. *B. gallinarum* has been found in the ovary of diseased fowls and in the non-absorbed yolk of chicks.

There is parallelism with what is seen in bacillary white diarrhœa and the confusion is increased by the relationship of the germs of the two infections.

Cultures ingested do not always convey the malady, nor does subcutaneous inoculation, whether practised with infected blood or with cultures; inoculation of the spleen is more successful, while intravenous inoculation succeeds much more frequently.

Prevention of Fowl Typhoid.

Cleanliness, disinfection and good management are most important in the control of the malady. The very sick

should be killed and burnt. Permanganate of potassium is to be added to the drinking water. Sanitary therapeutic measures have little influence on the progress of the contagion and course of the disease. Vaccination deserves to be used for its prevention. One advises treated vaccines or, better, vaccines treated by alcohol-ether (Truche). It is important to use a large number of microbian strains in their preparation. In particular cases use may conveniently be made of stock vaccines. It is preferable to employ auto-vaccines. Resistance may be strengthened by a second inoculation five days after the first.

The bacteriophage (d'Herelle) may quickly stay the evolution of the malady, but the effect lasts only two or three weeks; in its preparation use should be made of several microbian strains; an autobacteriophage should be utilised.

Transmission to Man of Fowl Typhoid.

The relation of the microbe to that of human typhoid suggests a danger of its transmission to man through eating flesh of diseased birds insufficiently cooked, but there are no facts to confirm such a surmise.

W. R. D.

Immunisation against Fowl Plague.

By Dr. C. Truche,
Chef de Laboratoire à l'Institut Pasteur, Paris.

Two methods are available for the production of immunity against fowl plague: serum-therapy and vaccination.

(*a*) *Serum-therapy.*—It is an easy matter to prepare specific serum by hyperimmunising which have either recovered from natural infection, or have been infected experimentally with blood or other virulent material. While this method is theoretically possible, it has scarcely been applied in practice on account of the difficulty of preparing large quantities of serum.

(*b*) *Vaccination.*—A great variety of methods have been tested for this purpose, employing living, modified or dead virus.

(1) Vaccination with unaltered virus. This includes attempts involving the use of sub-lethal doses, an infection by the ingestion of infective material. Little success has been achieved.

(2) Vaccination by modified virus. To effect this, virus attenuated either by heat or by desiccation by caustic potash has been employed. As in the Pasteurian method as applied to rabies, the brains are suspended above caustic potash for a varying length of time.

Generally speaking, this method yields very mediocre results, and it is still in the experimental stage.

(3) Vaccination with dead virus. A large number of investigations have been carried out, principally by Pfenniger, with virus sterilised either by heat or by chemical agents. Basing his experiments upon the essential fact that the virus occurs in the central nervous system, he has attempted to treat the brains first with carbolic acid and then with ether.

His conclusions show that vaccination with virus thus modified is borne comparatively well, but the immunity conferred is too weak to resist a test with virulent material 40 days later. A new method devised by Staub, of the Pasteur Institute, Paris, which appears to give better results in vaccination by means of formolised infective spleen pulp. The author, however, admits that the immunity acquired is of short duration, and should be reinforced by an inoculation with virulent material within eight days of the vaccination.

Todd, after testing the vaccination with formolised spleen pulp without success, suggests another method in which carbolic acid and glycerine appear. This author claims to have obtained good results because the animals tested resist infection with millions of lethal doses of infective material.

The recent publications of Doyle on the one hand and Lagrange on the other, regarding the occurrence of pseudo-fowl plague in England and in Egypt, do not help to clear up the problem, but they are of great interest as indicating the various types of these diseases.

Until something new makes its appearance we are in favour of Staub's method, which is remarkable both for its simplicity and its practical economy.

Chronological History of the International Veterinary Congress.

(*Reprinted from "The North American Veterinarian."*)

1863. The first congress was instigated by Gamgee of the Royal (Dick) Veterinary College. Place, Hamburg, Germany. Attendance, 99.

1865. The second congress convened at Vienna, Austria. President, Röll. Attendance 168. Questions of sanitary police were discussed, all by German reporters.

1867. The third congress was held at Zurich, Switzerland. President, Zangger. Among the reporters were La-Fosse, LeBianc, and Zundel.

1883. The fourth congress was to have been convened at Brussels, Belgium, in 1870 but was prevented by the Franco-Prussian War. In 1882 the national veterinary congress of Belgium instigated holding of the interrupted fourth congress in connection with the celebration of the 150th anniversary of the veterinary school of Brussels. Attendance 300. Although the previous congresses were devoted almost exclusively to sanitary police measures, the fourth congress included questions of professional interest: education, organization of veterinary services, and therapeutics. Paris was chosen as the place for holding the next congress.

1889. The fifth congress was held during the Paris Universal Exposition of that year. Nocard was the chief instigator and animating figure. Attendance, 650 of whom 180 were from foreign countries.

1895. The sixth congress was held at Berne, Switzerland. The congress was well organized. Those who presided were Chauveau, Lydtin von Raupach, Hutyra, Berdez, and Müller. The oustanding feature of the congress was Nocard's brilliant presentation of the diagnostic value of tuberculin.

1899. The seventh congress was held at Baden, Germany. It was organized by Lydtin and was an unprecedented success. Attendance, 958, of whom more than half were from foreign countries. Those who presided were Nocard, Hutyra, Schuetz, Degive, Berdez, Esser, Dammann, and Siedamgrotsky.

1905. The eighth congress was held at Budapest, Hungary. It was admirably organized by Hutyra and von Rätz. This congress was in reality the point of departure

for the fixed organization that now sponsors the mobilization of the world's veterinary forces at more or less regular intervals.

1909. The ninth congress was held at The Hague. It was prepared by Wirtz, Thomassen, Schimmel, and particularly de Jong, who retained the office of general secretary until the time of his death. Attendance 1,400, of whom 900 were from foreign countries. This congress had a section on tropical diseases and one on military veterinary service.

1914. The tenth congress was convened at London on August 2nd, the day the World War broke out. Two more or less confusing meetings were held before the congress adjourned and the delegates departed hurriedly to their respective countries.

This world cataclysm seems to have completely disrupted the permanent organization of the congress. Little by little, however, the situation cleared up, and, largely through the good offices of the section of hygiene of the League of Nations at Geneva, it was decided to pick up the remnants of the permanent committee. A reunion of the committee was held in Paris on June 15th, 1928, in connection with the meeting of *l'Office Internationale des Epizootic* at which time Professor de Blieck of Utrecht was named to succeed Professor de Jong. On the invitation of Sir John M'Fadyean it was decided that the next congress be held at London in 1930, to begin again where the brutally interrupted congress of 1914 was disbanded.

At this Paris meeting Professor Hutyra (Hungary) was named president; Professor Leclainche (France) and Sir John M'Fadyean (England), vice-presidents; Professor de Blieck (Holland), general secretary and treasurer, and Professor Stang (Germany), secretary. A second meeting was held in Paris in May, 1929, for the purpose of outlining the programme.

1930. The eleventh congress was held at London, August 4th to 9th. Attendance 1,800:—1,478 members, 42 extraordinary members, 290 ladies.

It was decided to hold the next (12th) congress in the United States of America in 1934.

Milk For Pigs.

A pig-feeding experiment carried out last year by the Ministry of Agriculture in conjunction with four research-centres is of some interest in view of the danger of another milk-glut. The results, it is true, were not entirely conclusive, and the report states, with great common sense, that it is impossible to attach any fixed financial value to milk for pig-feeding purposes. But with cereal-meal (sharps and barley) at 10s. a cwt., and bacon at 11s. per score dead-weight, the experiment returned a value ranging in the case of whole milk from 7d. to 11d. per gallon, and in the case of separated milk from 4½d. to 9d. This outlet for milk has obvious limitations, but it is evident that farms which are badly situated or ill-adapted for milk-selling might well turn their attention to "dairy-fed" pigs. Milk is undoubtedly a tremendous asset in the production of the early-maturing light-weight pork which commands the highest and steadiest market prices, and the turnover is comparatively rapid. The fact that separated milk was not very much inferior to whole milk further suggests that pork-production, skilfully combined with the sale of cream or butter, should compare favourably with milk-selling, at any rate when the latter is conducted on the basis of "manufacturing" prices. Alternative outlets for milk which commend themselves for more extended trial are "baby-beef" and high-class table poultry.—*The Times.*

The Veterinary Record.
January 17th, 1931.

Adversity and Benevolence.

Bacon, in his essay on Adversity, says that "the good things which belong to prosperity are to be wished, but the good things which belong to adversity are to be admired. . . Adversity is not without comforts and hopes. . . Adversity doth best discover virtue." If we had no poisons we should need no antidotes.

It is with this theme running through our minds that we take this opportunity of expressing the grateful thanks of our profession to the Honorary Producer, the Cast, the War Office Dramatic Orchestra, the programme sellers and to all those who by individual and by collective effort not only enriched the Victoria Veterinary Benevolent Fund by approximately the sum of £70, but gave great pleasure to all who witnessed the play appropriately entitled "The Happy Ending," at the Rudolf Steiner Hall, on Thursday, January 8th. It is not the first time that the amateur actors of Maidenhead have come to the aid of the Victoria Veterinary Benevolent Fund, and if, to quote again from Bacon, the pleasure of the heart may be judged by the pleasure of the eye, it is to be hoped that we may at some future time have a repetition of their histrionic ability in aid of the same worthy cause. When such talent is displayed, such kind thought evidenced, and so much trouble taken, we should indeed be ingrates if our response as audience was not of the warmest, and partaking of the nature of a solemn duty. The example set by Maidenhead is surely one for others to copy. The greater the addition to the Fund, the better the relief to distressing cases of want, so many of which give great concern to the Executive Committee of the Fund. If adversity doth best discover virtue, truly that virtue is within us to be made manifest in those blessed acts of thoughtfulness for others, and in the joy of giving for the benefit of those of our community who are placed in necessitous circumstances. "The Happy Ending," depicting life's comedies and tragedies, so beautifully staged, and so admirably acted by every member of the cast, has supplied the *motif* whereby the best, or even the worst, within us is put to the test in common acts of charity and unselfishness.

The Victoria Veterinary Benevolent Fund provides, by means of small grants, varying from

7s. 6d. to 30s. a week, assistance to widows and orphans of veterinary surgeons and also to a few aged veterinary surgeons who have fallen on evil times. Every case is dealt with according to its merits. The largest grant is being paid to a widow with six young children, who are left entirely unprovided for, but 30s. a week is not enough to do more than keep them from actual want. In another case the brother of a deceased veterinary surgeon who is now over 80 years of age and bed-ridden, is receiving 20s. a week. A widow, aged 75, who is nearly blind from cataract, receives 12s. 6d. a week to eke out her own small income. The daughter of a veterinary surgeon who died in Government Service, has received a grant of £40 a year for several years towards her school fees till she was old enough to earn her own livelihood. These are but a few examples out of the forty odd cases dealt with by the Council during the year. To maintain these grants at least £25 a week is required, and half of this has to come from the voluntary subscriptions of members of the veterinary profession—a very limited source. Further contributions to the Fund are urgently needed. *Subscriptions of half-a-guinea or more will be gratefully acknowledged by the Secretary*, 10 Red Lion Square, London, W.C.1.

The Soiling System.

"The practice of soiling—that is to say, the use of green forage-crops during the summer instead of the grazing of pastures—has never entirely lacked advocates, and in 1920 it looked as if the experiment conducted by Mr. J. C. Brown at the Harper Adams College had shown that the system could be conducted on a practical basis suited to English conditions," says *The Times*. "The Ministry of Agriculture accordingly embarked on a programme of three experimental small-holdings which were situated in different parts of the country, and which were to be worked entirely on a soiling and milk-selling basis. These holdings were sold some 18 months ago, and the report issued recently gives an account of the difficulties encountered, difficulties so serious that the experiment can only be described as a disappointment. It is not easy to say which factor was the prime cause of failure; the holdings seem to have been unnecessarily small, the management had perforce to be left to paid foremen, and the cows selected do not appear to have been entirely suitable. These results do not, it is true, entirely disprove the conclusion arrived at in the Harper Adams experiment, and there is no doubt that were the country once more threatened with starvation some modification of the soiling system would be of great service."

Wyley's Elixir Bromo-valerian Co.—This product, introduced by Wyley's, Ltd., of Coventry, has been prescribed in cases of cerebral excitement, and it has been found to be an excellent sedative. The soothing effects are prolonged and there is no disturbance in the animal's gait.—*"V.R." Test Report.*

Clinical and Case Reports.

A Specific Stimulus for the Respiratory Centre.

By W. P. Blount, M.R.C.V.S., Derby.

It will readily be recognised that a specific stimulus for the respiratory centre would be an invaluable addition to the accessories of the operating room.

The two drugs which are commonly used for stimulation of respiration are unsatisfactory in that their action is uncertain or dangerous: I refer, of course, to hydrocyanic acid, and liquor ammonii fortis. Unfortunately, the veterinarian is from time to time faced with a certain number of operative cases which cause him anxiety because he fears that respiration may cease under the influence of general anæsthesia. The two chief causes of this experience are: (1) old age affecting both the cardiac and respiratory organs, and (2) specific lesions affecting the tract of the latter. There is, in addition, an equally grave cause of unknown origin in respiratory failure, as seen on the operating table, *i.e.*, where the animal usually appears quite normal concerning pulse and respirations, but, suddenly, in the middle of the operation, respiration ceases and death frequently ensues. In such cases it is assumed that the particular animal was oversensitive to the paralysing action of the anæsthetic: a condition which cannot be pre-determined.

That the respiratory centre does differ remarkably in its response to stimuli is frequently seen when endeavouring to destroy animals by overdosage of prussic acid. Some animals quickly assume the typical picture of poisoning by prussic acid, deeper and more rapid respirations appearing in about one quarter of a minute, followed by the characteristic howl and finally succeeded by respiratory paralysis and death within a very short period. Others take considerably longer before any really noticeable signs appear, and some dogs even appear to be insensible to the drug's action. One usually assumes that the acid is old and has deteriorated, but the writer on at least two occasions when using fresh solution has failed to cause death in a rapid manner by the oral and intra-thoracic administration of prussic acid. On the other hand, in some animals it is possible to produce death quite rapidly by placing two or three drops of the acid on the cornea, absorption taking place by the conjunctiva.

It is the primary action of the hydrocyanic acid which is utilised by the anæsthetist in cases of operative respiratory failure, one or two drops of the drug being placed on the back of the tongue. In many cases this is sufficient in itself to recommence inspiration, but care has always to be exercised lest death should ensue. If no response is evinced the ammonia bottle is usually held close to the patient's nose whilst artificial respiration is practised; its action is, however, uncertain and not sufficiently strong to be of real value. Artificial respiration should always be practised, but in spite of all efforts, a proportion of cases end fatally.

Lobelin (Ingelheim) is a proprietory preparation possessing specific properties for the stimulation of the respiratory

centre direct. I was first made acquainted with its value by Dr. Henry Dryerre, who, at that time, was using it for certain vivisection experiments at the Edinburgh University. Unfortunately, I have had only two opportunities of testing its effects, but as they were undoubtedly specific in their stimulation of the respiratory centre, and as such a substance is obviously of value to the profession, perhaps I may be excused writing this article on such limited experience.

Case 1.—Aged Pomeranian terrier, weight about 6 lbs., undergoing extraction of molars under general anæsthesia. Light anæsthesia had been maintained for about three minutes with chloroform, when respiration ceased. Artificial respiration was commenced at once, the tongue pulled well forward and two minims of prussic acid placed on the fauces. Several minutes afterwards there were no signs of breathing and one-half of a 3/20th gr. ampoule of lobelin was given intra-thoracically (as the client was waiting for the animal proceedings were considerably hurried). In addition to inhalation of ammonia, ½ c.c. of adrenalin was administered. The pulse at this stage was definitely weak. Finally, a full 3/20th gr. ampoule of lobelin was administered, as before, intra-thoracically. Very shortly afterwards respiration commenced, even and shallow at first, but a few seconds later they were much deeper than normal and were quickly extraordinarily deep—so much so that they simulated the type seen during the first stages of prussic acid poisoning. It was then realised that the large size ampoule (3/20th gr.) had been used instead of the smaller size of 1/20th gr. and that the animal was obviously suffering from lobelin poisoning. Spasms of the limbs took place, kicking movements of the hind legs and jerking movements of the neck. These lasted about three minutes, but for a full quarter of an hour the animal seemed very sensitive to noises and would twitch involuntarily at unusual or loud sounds. In half an hour the animal was relatively normal and restored to the owner who, of course, never realised what had taken place. The specific action of the drug seemed certain, and also the fact that an overdose, although producing signs rather disturbing in character, was not fatal.

Case 2.—Six-year-old Sealyham terrier, undergoing hysterectomy. The anæsthesia consisted of morphia ½ gr., followed by ether and chloroform.

Towards the end of the operation it was seen that respiration had ceased, but, owing to the absorbing interest of the case, no one knew for how long. It was ascertained by stethoscope that the heart was still beating, though weakly. Owing to the larger size of the animal a 3/20th gr. ampoule of lobelin was given by direct method into the heart, and artificial respiration commenced. In less than 15 seconds respiration was carried on by the animal itself. In character it was shallower than normal, but regular. In half a minute from the commencement of the injection respiration was at the normal rate, though still rather shallow. It continued as such throughout the remaining period of the operation.

It might be argued that in neither case is it certain that the result was due only to the injection of the lobelin, but the actual response of the respiratory organs was quite inconsistent with the usual type of recovery. The rapid response and the regular character of the breathing were noteworthy.

Both cases occurred whilst the writer was acting as assistant to Mr. F. C. Gillard, M.R.C.V.S., of Folkestone.

If these experiences are confirmed it would appear that we possess a drug the action of which is specific for stimulation of the respiratory centre, and one which is not fatal in toxic dosage. It will therefore be of value not only when respirations have ceased during operative procedures, but also as a preventive of respiratory collapse by injection subcutaneously before commencing general anæsthesia. Two other conditions which may be materially benefited by its use are respiratory failure by overdosage of morphia; and as an antidote to prussic acid poisoning.

Schafer, who formulated the present recognised method of artificial respiration as applied to man, obtained most of his information from work carried out on dogs. Lateral compression of the chest walls was found to give best results, in that deep expiratory movements were possible and consequently the succeeding inspirations allowed a fairly full complement of oxygen to enter the alveoli. Movements of the fore-limbs were not found to be of particular value in artificial respiration and should therefore, if used, be discarded.

It is important to remember that when attempting artificial respiration, whatever animal is involved, the rate of compression of the chest should equal the normal respiratory rate. In the excitement of the moment many practitioners tend to increase greatly the rate in the hope of stimulating the respiratory centre more rapidly; in this they fail, however, because the CO_2 content of the blood tends to be lost *via* the lungs instead of retained for stimulation of the respiratory centre *via* the bloodstream.

In cases of respiratory failure the suggested method of treatment is as follows:—

(1) Ascertain if the heart is still beating, and, if not, inject direct into it a quantity of adrenalin chloride solution 1: 1,000.

(2) Inject either intra-thoracically or into the heart itself (according to the severity of the case) a quantity of lobelin (Ingelheim).

(3) Commence artificial respiration, compressing the chest walls at the normal respiratory rate.

(4) Refrain from continuing the artificial respiration once the animal commences to breathe regularly.

(5) Maintain the body temperature.

"Temperature."

By J. G. Hoban, M.R.C.V.S., Whitchurch.

A good class Shire gelding, six years old, had been working on the land all day (Saturday, December 6th, 1930), and appeared quite normal until returning home about 4 o'clock, when he began to stagger and sweat profusely. He was kept on his feet until he reached the stables, where he lay down and rolled.

On arrival I found him standing "stock-still," pouring perspiration; his expression was very anxious, the mucous membranes were very injected, the mouth clammy, his breathing laboured and very rapid, and his pulse "thready"—but the temperature stood at 109° F., as verified on two

thermometers and twice on one of them. The whole appearance of the animal was that of one about to collapse. A hypodermic injection of morphia was given, really with the object of easing the animal's end. Enquiries *re* feeding revealed nothing unusual.

The subject was seen again in an hour. There was little change in the general condition, but the animal was now lying flat out—his temperature was still just over 108°. Two hours later, when seen again, he stood still in a corner, his ears drooping, and his general expression and appearance hopeless. Perspiration was running off him and he reeled when moved. His temperature was 107°. The owner was away on this visit being paid, otherwise the animal would have been shot. Another dose of morphia was given.

A 'phone enquiry next morning elicited the information that the animal was still alive—had eaten a bran mash, drunk some water and seemed free from pain. When seen, the change in the animal was startling: he seemed to have practically recovered (temperature 101°) and, with the exception of his heart, was normal. The heart beats could be heard yards away and each beat shook the animal all over. A dose of aconite and nux vomica was given, and when seen later that day the animal seemed fully himself —temperature and heart normal. He had passed dung and water, both being natural. He ate greedily and though he had lost a good deal of flesh, he rapidly regained it and is now (December 22nd) working as usual.

The points of interest in this case are:—the extraordinary temperature; the recovery of an animal which, to all appearances, was on the point of death, and the heart "throb" on the second day (possibly due to the morphia).

I regarded the case at the onset as a clear one of acute peritonitis following rupture or "twist," and later as possibly pericarditis—but would not now like to venture an opinion as to what was the trouble.

Experiments on Fowl Plague.

By Z. Morcos, M.V.Sc., F.R.C.V.S., D.V.H.,
Professor of Bacteriology, Cairo School of Veterinary Medicine.

Symptoms.—Whether infection was induced by contact or inoculation, the period of incubation varied from two to nine days. Infection by contact took a longer period than by inoculation.

A peracute course used to pass unnoticed, the bird was simply seen dead in the morning and on *post-mortem* nothing characteristic was seen beyond highly congested internal organs and hæmorrhages over the mucous and serous membranes.

A sub-acute course was common, when all the joints, especially between the claws and the maxillæ of the head, were distinctly swollen; the bird looked dull; later it became paralysed, but never lost consciousness.

Copious salivation and profuse nasal discharge were constant features, while discoloration of the unfeathered areas and diarrhœa were met with, but not constantly so.

Egyptian PIGEONS were solidly immune against the virus of fowl plague, Egyptian strain.

Post-mortem.—Infiltration round the joints of hæmorrhagic gelatinous exudate, congestion of the internal organs, discoloration of the head and breast and, finally, hæmorrhages of the serous and mucous membranes and enteritis, the latter being occasional and not a constant finding.

Behaviour of the Virus.

Filtration.

All dilutions were made with sterile normal saline.

Egyptian fowls, six to eight months old, were used unless otherwise mentioned.

Virulent material was always collected just at the point of death or immediately after.

Post-mortem was made on every bird and blood films and cultures examined to avoid any double infection.

***Experiment* 1.**

Inoculations were made intramuscularly unless otherwise mentioned.

Fowls 1 and 2 each received ½ c.c. Seitz 1/25 blood filtrate.

Fowls 3 and 4 each received ½ c.c., L5 1/25 blood filtrate.

Fowls 5 and 6 each received ½ c.c., L3 1/25 blood filtrate.

Fowl 7 received ½ c.c., 1/25 defibrinated unfiltered blood (control).

Result.—No. 7 died on the third day with fowl plague; 1, 2, 5 and 6 died on fourth day with fowl plague; 3 and 4 died on the sixth day with fowl plague.

***Experiment* 2.**

Fowls 8, 9 and 10 each received ½ c.c., 1/25 blood Seitz filtrate.

Fowls 11, 12 and 13 each received ½ c.c., 1/25 blood L5 filtrate.

Fowls 14, 15 and 16 each received ½ c.c., 1/25 blood L3 filtrate.

Fowl 17 received ½ c.c., 1/25 unfiltered blood (control).

Result.—Fowl No. 17 died on the third day with fowl plague. Fowls 14, 15, 16 and 13 died on fourth day with fowl plague. Fowls 8, 9, 10, 11 and 12 died late on the fourth day with fowl plague.

Hence the passage of the* VIRUS *through Seitz, Chamberland L5 and L3.

Infectivity of Serum Corpuscles and Corpuscle Washings.

***Experiment* 3.**

The blood was collected from infected fowls just prior to death, centrifuged for one hour; serum carefully pipetted off and used. Corpuscles were washed in saline, centrifuged for 20 minutes, and the process was repeated five times; the last washing being used for inoculation.

Fowls Nos. 18, 19, 20, 21 and 22 each received 0·1 c.c. serum.

Fowls Nos. 23, 24, 25, 26 and 27 each received 0·1 c.c. washings.

Fowls Nos. 28, 29, 30, 31 and 32 each received 0·1 c.c. corpuscles.

Fowl 33 received 0·1 c.c. of this blood (control).

Inoculations were given in the muscles of the breast or thigh.

Result.—Fowl No. 33 died after 29 hours with fowl plague and all the remaining died within the fifth day of inoculation.

Thus the serum, corpuscles and corpuscular washings of the infected bird, are infective.

Experiment 4.

Fowl 34 received 0·1 c.c. of 1/1,000 defibrinated virulent blood.

Fowl 35 received 0·1 c.c. of 1/100,000 defibrinated virulent blood.

Fowl 36 received 0·1 c.c. of 1/1,000,000 defibrinated virulent blood.

Result.—Fowls 34 and 35 died on the fourth day with fowl plague. Fowl 36 died on the sixth day.

Hence blood is highly infective in very small doses.

Experiment 5.

Immediately after the death of the infected bird, a sterile swab was placed into the cloaca and a fæcal emulsion made. A swab was separately smeared with nasal and salivary discharges and an emulsion in sterile saline was prepared.

Fowls 37, 38 and 39 were inoculated with fæcal emulsion, Fowls 40, 41, and 42 were inoculated with naso-salivary discharge.

Fowl 43 was inoculated with very little of the bone marrow of the dead fowl.

Result.—Fowl 43 died after 48 hours with fowl plague. The other six fowls died within the third day with plague.

Thus fæces, bone marrow and oculo-salivary discharges are infective.

Experiment 6.

A hen laid an egg on the second day of inoculation, and died on the third. Fowls 44 and 45 were inoculated with 0·5 c.c. each of the beaten egg.

Result.—Both fowls kept well and on being inoculated with 0·5 c.c. with virulent blood 15 days after the egg inoculation, died on the fourth day of the blood inoculation with plague.

There is a possibility that the virus does not pass through eggs.

Inoculation of Pigeons.

Experiment 7.

Pigeons 1, 2, 3 and 4 each received 0·5 c.c. defibrinated blood.

Fowl 46 received 0·25 c.c. of the same blood.

Result.—The fowl control died on the third day of inoculation with plague, but the pigeons kept well for five months, after which they were released.

Experiment 8.

Pigeons 5, 6, 7, 8, 9, 10, 11 and 12 were given each 1 c.c. defibrinated blood.

Fowl 47 received 0·1 c.c. of the same blood and died three days after inoculation, while the pigeons kept perfectly healthy for five months. All pigeons used were of the ordinary *baladi* breed (Egyptian breed).

Result.—Egyptian-bred pigeons are insusceptible to fowl plague.

Experiment 9.

Fowls 48, 49, 50, 51 and 52 were fed on the intestines of a dead fowl which was previously inoculated with virulent blood.

Result.—All the five fowls died between the fourth and sixth day of being fed.

Experiment 10.

Fowls 53, 54, 55, 56, 57 and 58 were simply put in the same cage with one inoculated fowl, No. 59.

Result.—No. 59 died on the third day of inoculation and was then removed away. The contact fowls died between the sixth and ninth day of being admitted into the cage.

Thus feeding on contaminated material and contact are sources of infection.

. . . . .

Attempted Immunisation.

Before any vaccine was prepared, the virulence was first ascertained in *every* case by fowl inoculation before the vaccine was prepared.

Heated 1/25 defibrinated blood.

Experiment 11.

Fowls 60, 61, 62, 63 and 64 each received 1 c.c. defibrinated 1/25 blood kept at 45° C. for 30 minutes.

Result.—All birds died with plague on the fourth and fifth days of inoculation.

Experiment 12.

Fowls 65, 66, 67, 68 and 69 each received 1 c.c. at 50° C. for 30 minutes.

Result.—All the birds died within the sixth day of inoculation with plague.

Experiment 13.

Fowls 70, 71, 72, 73 and 74 each received 1 c.c. defibrinated blood kept at 57° C. for 30 minutes.

Result.—All kept well; after 15 days each was given 0·1 c.c. virulent blood, when all died with plague on the fifth and sixth days of inoculation.

Experiment 14.

Fowls 75, 76, 77, 78 and 79 each received 2 c.c. defibrinated blood heated at 57° for 30 minutes; seven days later, each was given a second dose of 2 c.c., heated at 57° C. for 30 minutes.

Three weeks after the second dose, each received 0·1 c.c. virulent blood.

Result.—All the birds died within the eighth day of the last inoculation with plague.

Thus heated blood does not confer any immunity. The virus loses its virulence on being exposed to 57° C. for 30 minutes but not at 50° C. for 30 minutes.

Defibrinated Blood Diluted with Saline, 1/25 Treated with Chemicals.

The chemicals were added separately, shaken to ensure thorough mixing, allowed to act for two days at room temperature before use, then kept in an ice-chest for storing and reference.

Experiment 15.

Fowls 80, 81, 82, 83 and 84, each received 2 c.c., 1/1,000 formalised, 1/25 defibrinated blood. Ten days later, each received 0·1 c.c., 1/1,000 virulent blood.

Result.—All the fowls died within the seventh day of test dose.

Experiment 16.

Fowls 85, 86, 87, 88 and 89 each received two successive doses of vaccine, as in Experiment 15, at one week's interval. Ten days following the second dose, each was given the same amount of test dose as in the previous experiment.

Result.—All the birds died between the fourth and seventh days of test dose.

Experiment 17.

Trikrisol 0·5 per cent. was added to 1/25 defibrinated blood.

Fowls 89, 90, 91 and 92 were given each 2 c.c. and test dose (test dose adopted, 0·1 c.c. of 1/1,000 virulent blood) ten days later.

Result.—All the four birds died on the fourth day of the test dose.

Experiment 18.

Fowls 93, 94, 95, 96, 97, 98, 99 and 100 were given two successive doses of trikrisol vaccine at seven days interval, 15 days after the second dose the test dose was given.

Result.—Three birds died after five days, three on the seventh day and the last two died on the eighth day.

Experiment 19.

Toluene 0·5 per cent. was added to 1/25 defibrinated blood.

Fowls 101, 102, 103, 104, 105 and 106 each received 2 c.c., but all died within the seventh day of inoculation.

Thus formalin (commercial) 1/1,000, trikrisol 0·5 per cent., acting for two days, destroying the virus, but did not confer immunity, while toluene 0·5 per cent. did not destroy the virulence of the virus.

Vaccines Prepared from Livers, Brains or Spleens of Infected Birds.

The organ was weighed, well emulsified in a sterile mortar, and 1/30 dilutions adopted. Whether dried or a chemical allowed to act, a period of two days' exposure at room temperature was always allowed.

Experiment 20.

Immediately the infected fowl died, the liver was spread on plates after thorough emulsification, allowed to dry under sulphuric acid, weighed, diluted and used.

Fowls 106, 107, 108, 109 and 110 each received 3 c.c.; ten days later they were given a test dose and all died within the seventh day of the test dose.

Experiment 21.

Fowls 111, 112 and 113 each received 3 c.c. brain emulsion treated as in Experiment 20 and all died within the sixth day of their test dose 12 days after the vaccine.

Experiment 22.

Fowls 114, 115, 116 and 117 each received 2 c.c. of brain emulsion treated with ether. The ether was added in 5 per cent., the ether well mixed now and again by shaking; after 48 hours, the emulsion was put in the incubator for a few hours to drive the ether out.

Fifteen days later, a test dose was given, when all the birds died within the seventh day.

Experiment 23.

Virulent fowl liver was emulsified, diluted 1-25, and formalin added 1/5,000, which was left to act for two days before use.

Fowls 118, 119 and 120 each received 1 c.c.; seven days later 2 c.c. were given; 12 days later the birds were fed on cut-up intestines of an infected dead fowl, and all died within the ninth day of test.

Experiment 24.

1/5,000 formalin spleen emulsion, an emulsion of 1 gram spleen to 30 c.c. saline, used two days after the addition of formalin.

Fowls 121, 122, 123 and 124 each received 2 c.c.; 13 days later they were fed on infected intestines of a dead fowl, but all kept well; a month later each was given a test dose of V.B. without any deaths.

Experiment 25.

Fowls 125, 126, 127, 128, 129 and 130 (Cyprus fowls) each received 2 c.c. spleen vaccine; left in contact with two infected fowls and kept under observation for 15 days after the death of the two inoculated ones. Ten days later, they were given a test dose of V.B. intramuscularly, without ill effects.

Three months after the last dose, they were given a test dose of V.B.: proved immune.

Experiment 26.

0·5 per cent. carbolic acid, and 50 per cent. glycerine were added to liver emulsion. Fowls 131, 132 and 133 were given 2 c.c. each; 12 days later they were fed on infected intestine (in feeding on infected organs, very small pieces in small quantities were used), but all died with plague.

Experiment 27.

Fowls 134, 135, 136, 137 and 138 (Cyprus) received two successive doses of 2 c.c., at one week's interval, of carbolised liver vaccine; a test dose 15 days later, but all died within the tenth day of the V.B. test inoculation with fowl plague.

Using more than two doses would be impracticable; the vaccine was discarded.

Experiment 28.

Fowls Nos. 139, 140, 141, 142, 143 and 144 each received 2 c.c. mixed liver-spleen emulsion 4 : 1, 1-30 dilution, treated with 1/5,000 formalin for two days.

Ten days later, a second dose was given of 2 c.c. vaccine; three weeks after they were fed on infected intestines.

Result.—Two fowls proved immune, but the rest died with plague between the eighth and tenth day of their infective feed.

Experiment 29.

The same vaccine as in experiment 28, but carbolic acid and glycerine were used instead of formaldehyde.

Fowls Nos. 145, 146, 147, 148 and 149 (Cyprus breed) received two successive doses of 2 c.c. followed in three weeks by V.B. test dose.

Result.—Three fowls died after nine days of the test dose and the remaining two died on the eleventh day.

Experiment 30.

Spleen emulsion, 1/30, formalin added 1/5,000, acting for two days at room temperature and then used and stored in ice-chest.

Fowls 150, 151, 152, 153, 154, 155, 156, 157, 158, 159 and 160 (11 Cyprus) received 2 c.c. each. Three weeks after a test dose of V.B. (0·1 of 1-1,000) was given.

Result.—All the birds proved immune (V.B. controlled).

Summary.

Symptoms:

When the disease takes a peracute course, the bird may be found dead without any warning; or simply look dull all of a sudden and die in a very short time.

The disease in most cases takes a sub-acute course indicated by: Swelling of the joints, most noticeable at the head and foot pads; total dullness followed by paralysis but without coma; profuse salivation and copious nasal discharge and, in many cases, discoloration of the unfeathered parts, also diarrhœa. Death rate in outbreaks in Egypt is very high, practically 100 per cent.

The virus passes through Seitz, L5 and L3 filters.

The blood—its serum, corpuscles and corpuscular washings—of an infected bird is highly infectious; a fraction of 1/1,000,000 is sufficient to induce infection.

Fæces, oculo-nasal discharges and bone marrow are infective.

Contaminated food or water, also contact, are means of spread.

Egyptian-bred pigeons are resistant to fowl plague virus, Egyptian strain.

Virulent blood, heated or treated by chemicals, does not confer immunity.

Formalised spleen emulsion is protective in single doses; from a practical point of view, the method is not very helpful: one bird will only immunize thirty birds.

Abstract.

[**Digestive Efficiency with Various Foods.** Childrey, Alvarez and Mann (*Archives of Int. Medicine.* September, 1930).]

The authors report on the efficiency of various foods given to dogs under various conditions, and the report contains much practical information for all who are interested in feeding dogs.

Six dogs were used in an experiment, in which animals the distal end of the ileum had been joined to the stump of the rectum. This had been done for the purpose of studying digestion in the small intestine without the handicap of the irritation of the skin occasioned by fæcal discharges issuing from ileal fistula surgically produced, as has been customary in such studies.

The following is a brief summary of the conclusions arrived at by these workers:—

1. Sour milk is better digested than sweet milk.

2. That bread, egg, meat, etc., added to milk, decreased the amount of residue passed and increased its digestion.

3. Lactose has a purgative action, and when given daily, the bowel becomes increasingly irritable.

4. Cottage cheese in lumps is well digested. Grated Swiss cheese is hardly digested at all.

5. Coarse hard particles of food are slow to leave the stomach.

6. Meat is best digested when given in the form of lumps and the dog is following a good instinct when he bolts his food unchewed.

7. When meat was given finely ground, there was an increase in the amount of residue obtained.

8. Raw meat was digested better than cooked.

9. The limits of the digestion of fat could easily be reached. Lard or butter, given in considerable quantities, always produced foul-smelling stools. 10 grams for each kilo. of weight appeared to be as much as dogs could stand.

10. Dog buscuit containing bone meal, flour and chopped meat was found to leave a residue of 80-87 per cent. When lard was united with or melted into it, the residue decreased to 50 per cent.

11. Raw egg albumin runs through the digestive tract so rapidly that much of it reaches the ileo-cæcal sphincter unchanged. Soft and boiled eggs were digested much better. Soft boiled eggs left the least residue.

12. Raw egg given alone produces foul foamy liquid discharges. The addition to raw egg of raw starch, which is not digested by the dog, and which greatly slows the progress of material through the intestine, appeared to improve the digestion of the egg.

The addition of milk to raw egg resulted in a mixture which was better digested than milk alone.

Hosoi found that the residue from white bread was 44-52 per cent. Their results were better, *viz.*, between 26-41 per cent. Its digestion was improved when milk was added.

Dextrose and sucrose are almost completely absorbed, but efficiency of digestion depends on the concentration of material given. A concentrated solution of dextrose produced severe vomiting. Only a few dogs could return a 50 per cent. solution.

Potatoes, stewed tomatoes, stewed beets and baked bananas were all poorly digested and gave residues varying from 30-75 per cent. Potatoes were better digested when given in lumps than when mashed. Raw banana was the most poorly digested of all the foods studied.

Rice appeared to be almost perfectly digested.

It is probable that acids increase the rate of passage of material through the bowel. Meat was not so well digested when mixed with lemon juice.

. . . . .

They were unable to detect any difference in the fæcal residue from dogs which had eaten their food voluntarily and those which had been forcibly fed.

Anxiety and excitement tend to retard digestion.

It was not found that the temperature of food influenced the completeness of digestion in any way.

When a quantity of food was divided into fractions which were given to the dog at hourly or two-hourly intervals, the residues appeared more promptly than when the total amount was eaten at one time, and the percentage undigested was larger. This can be explained by the fact that each successive feeding stimulates peristalsis and gives rise to rush waves which carry the food rapidly down the bowel.

H. K.

Liver emulsions, dried or treated by chemicals in two doses, do not confer immunity.

Liver and spleen emulsions mixed 4/1 do not solidly protect, but retard and alleviate the course of the disease.

References.

Russ found the corpuscles to be many times more virulent than serum.

Schwetzer stated that the cause was an ultramicroscopic filtrable virus.

Doorr and Pick stated that the virus was non-pathogenic to guinea-pigs and rabbits.

Marchoux reported the successful cultivation of the virus on fowls blood media containing glucose, ærobically.

Todd claimed that the white cells were about 100 times more virulent than the plasma or other formed elements of the blood.

Todd failed to confirm Marchoux's reported successful cultivation.

Centanni failed to infect birds with ectoparasites living on infected birds.

Schiffmann immunised geese by dried spinal cord of infected fowls.

Staub reported the successful immunisation by using heated blood.

Todd reported the success of three repeated doses of carbolised liver emulsions and the failure of formalised emulsions.

Doyle failed to obtain immunity with repeated doses of heated spleen emulsion.

Army Veterinary Service.

London Gazette—War Office—Regular Army.

January 13th.—Major R. F. Bett, retires on retirement pay (January 12th).

Regular Army Reserve of Officers.

Major R. F. Bett (retirement pay), to be Major (January 12th), with seniority, April 28th, 1924.

N.V.M.A. Divisional Reports.

Royal Counties Division.

Successful Meeting at Camden Town.

The Royal Counties V.M.A. is the latest of the many Divisions of the "National" to benefit by the readiness of the Principal and staff of the Royal Veterinary College to house Veterinary Society meetings and, more often than not, to hold themselves responsible for the major portion of the programme.

On this occasion it was Professor J. G. Wright who willingly shouldered the task—always congenial to him—of presenting a paper on a clinical subject and thus one likely to prove of outstanding interest to the practitioner members, who still constitute by far the larger proportion of Fellows of the old-established Royal Counties Division.

Before the members assembled in the Large Lecture Theatre, they were interesteed witnesses of a repetition of a demonstration of Radiography as applied to the larger animals, by the use of his mobile X-ray unit, which Mr. H. J. Ede, Hon. Radiographer to the College, had given to the Central Veterinary Society on the previous day and which was described in the report of the meeting of that Division published in the *Veterinary Record* of December 27th, 1930.

At the present meeting, which was held on Friday, December 5th, 1930, the President of the Royal Counties Division, Major A. C. Duncan, of Cirencester, occupied the Chair and there were also present Messrs. J. R. Baxter, J. Bell, R. E. C. Bullen, Captain H. B. Collet, Mr. C. H. Ducksbury, Major G. W. Dunkin, Captain J. R. Hewer, Principal F. T. G. Hobday, Major H. Kirk, Major H. G. Lepper, Captain W. L. Little, Mr. J. W. McIntosh, Major-General Sir John Moore, Lieut.-Colonel P. J. Simpson, Major F. J. Taylor, Messrs. F. Willett, J. Willett, R. A. Willett, Captain E. C. Winter and Mr. H. Bell, Hon. Secretary. There were also present, as visitors, Messrs. K. I. Barlow, E. W. Dawe, A. E. C. Foster, J. W. Holmes, A. J. James, Dr. J. McCunn, Messrs. L. R. Morford, H. B. Shaki, G. B. Singh, K. B. Singh, D. E. Smith, R. Southern and T. C. Strachan.

The minutes of the previous meeting, which had been published in the *Record*, were taken as read and were confirmed on the proposition of Major Dunkin, seconded by Mr. J. Willett.

Correspondence.

(1) From Messrs. C. P. Inglis, G. P. Male, Major E. E. Seldon, Mr. S. H. Slocock, Colonel G. K. Walker, Mr. E. Wilkinson and Captain D. Wyllie, apologising for their inability to attend the meeting.

The President observed that, in connection with that list of apologies for absence, all present would be very sorry to learn that Mr. E. Wilkinson, of Witney, was very seriously ill. He thought it would be their unanimous wish that their Secretary should write to convey their sincere sympathy with Mr. Wilkinson and their earnest hopes for his speedy restoration to health. (Hear, hear.)

(2) From the N.V.M.A., suggesting that a committee of the Division should be appointed to exert their influence, either individually or collectively, to induce members of the profession within the area of the Royal Counties to join the Association.

The President commented that he thought that a very proper thing to do. The matter had been considered by the Council of the Division, and it was suggested that a committee of three should be formed.

On the proposition of Colonel Simpson, seconded by Major Dunkin, the recommendation of Council was approved, and, on the proposition of Mr. J. Willett, seconded by Mr. J. W. McIntosh, the President, the Hon. Secretary and Major F. J. Taylor were appointed.

(3) From the N.V.M.A., informing the Division that, in consequence of an alteration which had been made in the Association's articles of association, they were now entitled to be represented on the Council of the "National" by the Hon. Secretary and one for every 35 members or portion thereof.

The President informed the members that that matter would be brought before them at a later stage in the proceedings.

Nomination for, and Election to, Membership.—Mr. J. R. Baxter nominated his son, Mr. A. J. Baxter, as a member of the Division, the President seconding, while Mr. N. P. Male was unanimously elected to membership.

Eleventh Veterinary Congress.—The President, on behalf of Mr. J. R. Hewer and himself, in their capacity as the Division's delegates to the Eleventh International Veterinary Congress, held in London in August, 1930, presented a report on the proceedings. The delegates were cordially thanked for their interesting report, on the proposition of Mr. J. Willett, seconded by Major Dunkin.

Election of Officers.

President.—Major Duncan, from the Chair, proposed the election of Major G. W. Dunkin as President of the Division for the ensuing year.

The proposition was seconded by Mr. J. Willett and carried with acclamation.

Major Dunkin, in returning thanks for his election, said that he would promise to do his best for the Division and to endeavour, with the aid of the Hon. Secretary, to provide those interesting and instructive meetings to which they had always been accustomed, though he could not promise to bring to the fulfilment of his duties that fund of humour with which they had been regaled by the past President.

Vice-Presidents.—Captain R. Collett, Vety.-Colonel Graham Rees-Mogg and Major F. J. Taylor were unanimously elected as Vice-Presidents.

Council.—Mr. J. R. Baxter, Professor J. B. Buxton, Major J. J. Dunlop, Mr. J. W. McIntosh, Lieut.-Colonel P. J. Simpson, Mr. F. W. Willett and Mr. J. Willett were unanimously re-elected to the Council of the Division, together with Mr. R. E. C. Bullen, as a new member, and the officers of the Division as *ex-officio* members, on the proposition of the President, seconded by Major Dunkin.

Hon. Auditor.—Mr. J. Willett.

Hon. Treasurer.—Mr. G. P. Male.

Hon. Secretary.—Mr. H. Bell.

The officers holding these three posts were re-elected, with thanks for their past services to the Division.

Representatives to Council, N.V.M.A.—The President

informed the members that, following upon the communication from the N.V.M.A., relative to this matter, which had been read, the Division was now entitled to an additional representative upon the "National" Council. The Hon. Secretary was a representative, *ex-officio*. The remaining representatives were elected as follows:—the retiring President, Professor J. B. Buxton and Mr. J. Willett. [The President is a representative of the South Eastern Division, N.V.M.A.]

Representative to Council. Victoria Veterinary Benevolent Fund.—The newly-elected President (Major Dunkin) was elected to this office.

Vote of Thanks to the Retiring President.—Major Dunkin proposed a very hearty thanks to Major Duncan for his "most valuable services" to the Division as President during the past year.

The proposition was seconded by Mr. R. A. Willett and carried with enthusiasm.

Major Duncan, in acknowledgment, characterised the expression of the members' thanks as being extremely kind. He had had a very pleasant year of office, but had really had very little to do, thanks to the excellent work put in by their Secretary, Mr. Bell.

Next Meeting.—It was decided that the next meeting, to take place on the last Friday in January, should be held at Reading.

Paper.—The President now observed that he was sure they all wanted to get on to the interesting practical work they had before them, and therefore he would ask Professor Wright to tell them something about his "Stray Thoughts on Clinical Diagnosis" as he had entitled his paper.

Professor J. G. Wright proceeded to read his paper, which was followed with the keenest interest, and which was the prelude to an animated discussion on the subjects dealt with therein. [Professor Wright's paper, together with a report of the ensuing discussion, appear earlier in this issue of the *Record*.—Ed.]

Exhibit.—At the conclusion of his paper, Professor Wright said that he desired to show them, by the courtesy of Mr. Formston, and in illustration of a condition mentioned in his paper, an excellent case of rupture of the diaphagm in a cat. The animal, some months before, had fallen from a school window, and the interesting feature of the case was the delayed fatal termination.

Demonstration.—Following the discussion, Professor Wright, assisted by Mr. Machin, gave a demonstration of Avertin narcosis in the cat. The subjects were two female cats, which were subsequently speyed.

The first cat weighed 2·75 kilos = 6 lbs., the dosage being ·3 c.c. per kg = ·825 c.c., *i.e.*, 15 minims in a 3 per cent. solution ·30 c.c. of water at 104° F.

The apparatus consists of a flask for the distilled water and a thermometer for registering its temperature, and a No. 10 catheter for introducing the narcotic into the rectum, by gravity. Avertin in 3 per cent. solution, said the demonstrator, was entirely non-irritant, and he had never seen it exercise the action of an enema. The drug was tri. brom. ethyl alcohol, bromine being the replacement product, $C.Br._3CH_2OH$. It occurred as a white, crystalline solid, but now the makers issued it as a solution dissolved in amylene hydrate; he greatly preferred the former preparation. They had anæsthetised 100 cats by Avertin, of which only one had died definitely as the result of the process, and in that the actual cause of death could not be ascertained. For operations about the head and face they would agree that it was a most useful agent. In over 50 per cent. of cats it produced general anæsthesia.

The subject was now injected *per rectum* with the Avertin solution, and in this case general anæsthesia was secured, taking place in three minutes.

The second cat was a younger and much smaller animal, and his (Professor Wright's) experience with Avertin was that animals under six months were less susceptible to its action than adults; therefore, he would increase the dose to ·4 per kg. The weight of this cat being 1·75 kg, the dose given was ·700 c.c. = 13 minims. In this case the animal was deeply narcotised in three minutes, anæsthesia being present in ten minutes. Both animals were operated upon under perfect anæsthesia. Recovery was normal 24 hours later.

The meeting concluded with the passing of hearty votes of thanks to Professor Wright for his paper and demonstration, to the retiring President for his conduct of the proceedings, and to the Principal and Staff of the College for their willing co-operation with the officers of the Division in making the meeting an outstanding success.

Before separating, the company took tea together in the Students' Common Room.

H. Bell, *Hon. Secretary.*

West of Scotland Division.*

Meeting at Glasgow.

Professor J. R. Grieg's "Observations on Milk Fever."

The West of Scotland Division, N.V.M.A., held a meeting in the Veterinary College, Glasgow, on October 15th, 1930.

Professor Geo. W. Weir, President of the Division, occupied the Chair, and there were also present Messrs. Hugh Begg, junr., David Brown, Dr. H. Dryerre, Professor J. Russell Greig, Messrs. Wm. Harley, Jas. Macfarlane, John Macfarlane, T. L. May, Major J. G. McGregor, Mr. Robt. Renfrew, Professor Wm. Robb, Messrs. E. G. Robertson, Jas. Sommerville, Andrew Stark, J. F. Taylor, Alex. Thomson, Dr. A. W. Whitehouse, Messrs. Peter Wilson and Donald Campbell (Secretary). In addition, a large number of students attended.

The Secretary intimated that a letter had been received from Mr. J. D. Pottie regretting inability to attend.

The minutes of the previous meeting, as published in the *Veterinary Record* of October 11th, were adopted.

Elections to Membership.—Messrs. John Macfarlane (Doune) and E. G. Robertson (Strathaven) were elected members of the Division.

N.V.M.A. Membership.—A letter was read from the General Secretary, N.V.M.A., inviting aid from the Division in securing new members for the "National." It was explained by the Secretary that this letter had been considered by the Committee of the Division, and that a reply had been sent to the effect that they were at present engaged in an effort to increase the membership

* Report received for publication December 4th, 1930.

both of the Division and of the parent body, and that they would take all practicable steps towards attaining that object. This course was approved.

Bovine Tuberculosis Eradication Scheme.—Members were greatly interested in a statement made by Mr. Whitehouse, describing briefly the recent progress of the Scheme for the Eradication of Bovine Tuberculosis formulated by the Scottish Branch. It was recalled with satisfaction that the credit of inaugurating this great work belonged to the West of Scotland Division.

The President then said it was his pleasant duty to introduce Professor J. Russell Greig, whose valuable work, done in co-operation with Dr. Dryerre, in the investigation of milk fever, had claimed the attention of veterinary surgeons all over the world. Dr. Greig would speak to them on "Observations on Milk Fever."

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Observations on Milk Fever.

By J. Russell Greig, ph.d., m.r.c.v.s.
Director, The Moredun Research Institute, Edinburgh.

Professor Greig, in introducing the subject, stated that, while appreciating very highly the invitation he had received from the Glasgow and West of Scotland Division to give a paper upon "Milk Fever," he had spoken and written so frequently upon milk fever during the past few years, that he felt it might be found more acceptable if, instead of presenting a formal paper, he offered something in the nature of an informal talk, sketching very briefly the history of the disease, the steps which led up to the recent researches of Dryerre and himself, their present conceptions of the pathogenesis and pathology of milk fever and of the nature of the remarkable specific efficacy of mammary inflation; followed by a discussion upon the nature of calcium therapy.

In describing the conceptions of Dryerre and himself of the pathogenesis of the disease, Dr. Greig made use of illuminating diagrams. He stated that, since the conceptions were those of Dryerre and himself, they were probably wrong, in so far that, while they appeared to fit in with all the known facts concerning the disease, one could not in these days make any dogmatic statement as representing the conclusion of any scientific question. Their knowledge of calcium metabolism was still so elementary that it was almost certain that their views would have to be modified as their knowledge increased, but nevertheless, he believed that the conclusions at which they had arrived were essentially right.

The conclusions arrived at, which were presented recently by Professor Greig to the Eleventh International Congress, may be summarized as follows:—

I. The essential cause of milk fever is an acute blood-calcium deficiency.

II. The specific curative action of mammary inflation consists in raising the blood-calcium values.

These conclusions are based on the following considerations:—

(1) Milk fever is invariably associated with an acute hypocalcæmia: It is the only blood constituent which invariably shows a marked alteration from normal.

(2) The more severe cases correspond with the lower calcium values.

(3) The fall in calcium is approximately coincident with the appearance of the symptoms.

(4) Tetany is a symptom in severe cases of milk fever and the occurrence of tetany is recognised as consequent upon pronounced hypocalcæmia.

(5) Mammary inflation raises the level of blood-calcium in a normal lactating animal.

(6) Mammary inflation elicits a marked rise in the level of blood-calcium in milk fever and cures the disease; the process of cure, as manifested in the disappearance of the symptoms, corresponds with the rise of the blood-calcium.

(7) Injection of calcium, exclusive of other treatment, raises the blood-calcium concentration and cures the disease.

(8) Milk fever in cows, lambing sickness in ewes, and transit tetany in mares are all rapidly cured by mammary inflation and these are the only conditions, in an examination of over 500 samples of blood, in which an acute hypocalcæmia has been found.

Dr. Greig had recently attempted to apply these conclusions to practice. The administration of massive does of Vitamin D for five days previous to, and three days after calving appeared to be of real prophylactic value. The investigations upon this matter, however, did not reach a stage at which any definite statement could be made.

The injection of calcium could be regarded as of specific curative value.

Calcium chloride possessed very irritant properties, and could not be injected subcutaneously or intramuscularly; the injection required to be made intravenously. There were two objections to an intravenous injection of calcium: One was the difficulty of its application in all cases of milk fever, and also one had to remember the fact that when calcium was injected intravenously it brought about a very rapid rise in the blood-calcium level; but this rise was transient, and the concentration soon fell again. The result was that, while cases of milk fever made a very rapid recovery as the result of intravenous injection of calcium, relapse was likely to occur. A subcutaneous injection, on the other hand, was more slowly absorbed, and the consequent rise in calcium was much longer maintained. The application of subcutaneous or intramuscular injection was comparatively easy.

In searching for a form of calcium which was at once therapeutically active and non-irritant, Dr. Greig obtained Calcium gluconate.

He believed that this method of treatment could be regarded as at least equal in its specific efficacy to mammary inflation and possessed certain advantages in so far that it obviated interference with the udder, and was a rational treatment based on scientific principles, thus giving the practitioner a certain prestige which he did not possess in practising the inexplicable treatment of mammary inflation.

There was no interference with milk secretion such as often follows mammary inflation.

The general practice of this treatment, too, would discourage pernicious home doctoring—mammary inflation being so largely practised by unskilled persons, often with dire results.

He had arranged with the makers of this preparation, Messrs. Sandoz, that it would not be supplied to any

person other than a member of the veterinary or medical professions.

On the other hand, a number of complaints have been received that the injection of calcium gluconate was not uncommonly followed by swellings that persisted for some days, and even resulted in abscess formation. He did not understand why this should be so. It was curious that some practitioners had had no trouble, while with others it was the reverse. It was, of course, necessary to ensure that the injection be made under aseptic conditions, but he believed that much of the trouble was due to the injection being too concentrated. Some practitioners had used solutions considerably higher than 10 per cent. That was very wrong. He believed that if a solution were made of the granules it should not exceed five per cent. in strength. Mr. Blampied, of St. Helier, who had given careful study to means for overcoming undesirable local complications, had recommended to him the use of a five per cent. solution, which is boiled for a few minutes shortly previous to injection, and allowed to cool to about 105° F. The solution is injected in front and behind each shoulder. The sites of injection are well massaged so as partially to disperse the solution. Following this method, he (Dr. Greig) found that no local complications occurred.

It was to be realised that Calcium gluconate was a curious salt, and even five per cent. solutions would precipate out in a comparatively short time. It was necessary, therefore, to understand that the solution should be prepared freshly.

The dosage adopted by various practitioners varied very widely, and depended upon the severity of the attack. The dose ranged from one-three ounces of the granules. Many practitioners relied wholly upon the ampoules and had taken as a standard of dosage 300 c.c. He would advise practitioners who had not yet practised the treatment, and who wished to do so, to begin by confining themselves to the use of the ampoules containing an already prepared solution.

He did not claim that the treatment was infinitely superior to mammary inflation. The comparative value of the two treatments could only be assessed by time and experience, but, at any rate, it was a rational treatment, and he believed its specific curative effects could be described as perhaps the most spectacular produced by a medicinal substance in any naturally occurring disease throughout the whole range of hominal or veterinary medicine.

Discussion.

Mr. Donald Campbell said that for 30 years milk fever had been associated with the honoured name of Schmidt. In future, joined with Schmidt would be the names of Greig and Dryerre. He was proud that this, the first great advance in 30 years, had been made in Scotland.

Greig and Dryerre had proved that an essential feature of milk fever was a fall in the calcium content of the blood, and that as the proportion of calcium rose again to normal, recovery took place. It was when they attempt to account for this phenomenon that difficulties began. He (Mr. Campbell) was not satisfied that drainage through the udder was an important cause of calcium deficiency.

Every cow on beginning lactation suffered large withdrawals of calcium in the colostrum and milk, but comparatively few took milk fever, the calcium being replaced, apparently almost as quickly as it was lost. It seemed then, that the cow with milk fever differed from the normal cow, not in the loss of calcium but in the apparatus of replacement.

In most cases of milk fever there was a great diminution in the milk yield, the disease itself thus bringing about the very condition usually attributed to inflation of the udder. Did spontaneous recovery then take place? Emphatically, it did not.

Further, cases of milk fever occurred in cows before eating, and at quite long periods after eating, when there was no question of sudden, large withdrawals of calcium *via* the udder.

From these considerations it would appear that the lowering of the calcium content was due to some defect in calcium metabolism, and that inflation, and probably also administration of calcium, achieved their results by bestowing some kind of shock or stimulus to metabolism. He agreed with Smythe's observation, recently published in the *Veterinary Record*, that inflation of the udder when a cow was in the very early stages of milk fever was followed immediately by a transient increase in the severity of the symptoms. Every practitioner would confirm that. It seemed to indicate something which, for want of a better word, he would call shock.

Referring to treatment, Mr. Campbell said that, in his opinion, the dangers attending inflation of the udder had often been exaggerated. Mammitis was not a frequent sequel if inflation was carried out by a veterinary surgeon. He had made enquiries among his clients as to any harmful effect of inflation on the milking qualities of cows, and only one had said that any ill result followed.

Calcium treatment, he agreed, was equally successful. He did not think intravenous administration in every case, as a routine measure, was practicable, while subcutaneous administration in 10 per cent. solution often resulted in serious abscess formation: Calcium gluconate appeared to precipate very readily, and he suggested that when it was injected subcutaneously in 10 per cent. strength, a portion of the calcium was precipitated in the tissues and caused necrosis. He did not admit that the occurrence of abscesses indicated careless technique. With even the most scrupulous adherence to instructions, abscesses would appear, if calcium at 10 per cent. were used. In his experience a five per cent. solution was equally effective, and almost completely eliminated the danger of abscess formation.

Concluding, Mr. Campbell said that in his remarks, if he had been at times somewhat critical, it was with no wish to diminish the greatness and importance of the work done by Professor Greig and Dr. Dryerre.

Dr. Dryerre dealt with some of the general points raised by Mr. Campbell. While it was quite true that every cow lost calcium in lactation, all cows were not equally supplied with an available source of this mineral. This deficiency might arise in two ways: an absolute shortage of available supply, or an inability to transport and utilise the calcium present. If either of these conditions was present, then the excessive demands of the mammary glands for calcium depleted the body fluids of this mineral, with a consequent interference with function in the animal. A low calcium intake would be a contributory factor. The alleviation of symptoms which followed inflation of the udder could be directly attributed to the arrest of the loss of calcium by this organ. Further, there was presumptive evidence that the mechanical pressure so exerted on the udder might actually return into the circulation some of the calcium which had concentrated in the vicinity of the mammary cells. That recovery was due to "shock" was hardly feasible, if that expression was used in its ordinary acceptance. Shock implied complete postration combined with a rapid soft pulse. In their original paper, Greig and he had suggested that the discomfort of inflation gave rise to a reflex secretion of adrenaline, but this had not yet been demonstrated. As to why it was sometimes necessary to reinflate a cow, this could be explained on the assumption that the first operation had been ineffective owing to the lack of development of sufficient tension.

Dealing with the criticism of the calcium gluconate method of treatment, he had several observations to make. He was not of the opinion that intravenous injection *per se* was an obstacle to its adoption. The technique was not difficult, and it, he might add, brought the treatment of

this disease once again into the hands of the professional man. He was of the opinion that intravenous injection might be avoided in many instances by administering the preparation intramuscularly. The question of the occasional appearance of sloughing was one which was receiving investigation. Sometimes it was due to faulty technique; in other instances there seemed to be some other factor. It might be due to the differences of resistance seen in different breeds of animals. It would be advisable, he thought, to make the solution no stronger than five per cent., that is, one ounce to the pint.

The question of the relationship between the ionised and unionised calcium had not been overlooked. There were difficulties in executing such estimations, but it was hoped that these would be overcome, and the problem further investigated.

In conclusion, Dr. Dryerre intimated that he had now become officially connected with the Animal Diseases Research Association. Although their headquarters were in Edinburgh, he hoped they would appreciate that this was a national association, and he looked forward to obtaining the co-operation of the practitioners throughout the country in carrying out the work.

Mr. May referred to a herd of cows in which cases of impaction of bowel were frequent. It was concluded that the trouble was due to hypocalcæmia, and treatment according to that view was undertaken. The bowel was rendered acid, and the herd put on a mineral diet. This line of treatment proved successful.

In a herd with many abortions it was discovered that phosphate manure was being omitted in the rotation.

Mr. Begg said he could add very little of benefit to the discussion except it were a few of his personal experiences with calcium gluconate.

In the late spring of this year, he was called to a number of cases where young cattle were found dead in the fields, and in some cases there were one or more other cattle very ill, unable to walk and apparently blind.

In several such cases he injected calcium gluconate subcutaneously and the animals slowly recovered. The injection was repeated for several days.

In every case eight or nine days passed before food could be chewed or swallowed, and meantime the animals were drenched with gruels of oatmeal and milk containing calcium chloride.

It had been his experience up till this year that such cases of so-called " grass staggers " always proved fatal, and if found alive, were salvaged.

He had also had few instances of dry cows showing symptoms of tetany, such as a drunken gait, grinding teeth and general unthriftiness, which did not respond to udder inflation, but 12 to 24 hours later, when calcium gluconate was injected, recovery took place in a short time —in two cases in 30 minutes.

In general he had used calcium gluconate as an adjunct only to udder inflation. Those cases in which he had used it alone were cows for immediate sale or for the show yard.

So far he had only had necrosis in one case, but there had been quite a number with abscess formation.

The Reply.

Professor Greig, in reply, thanked Mr. Campbell for his stringent but very fair criticism.

It had never been suggested by Dryerre and himself that the acute calcium deficiency which occurs in milk fever was due solely to the loss which was occasioned by a rapid exchange of calcium from the blood to the milk at the commencement of lactation; that was, he believed, an important cause of the deficiency, but, as he had stated in previous writings, that could not be the sole cause, otherwise every heavy milking cow would fall victim to an attack. It was rather, as Mr. Campbell had suggested, a failure to mobilise quickly the amount of calcium from the skeletal reserves requisite for the replacement of the deficiency, and it was for that reason that Dryerre and he had postulated a parathyroid failure.

He agreed that a great diminution of milk secretion frequently accompanied the onset of milk fever. It was possible that this represented a reaction of the animal organism to prevent further calcium loss. If it did prevent further calcium loss, one would expect that a number of cases recovered spontaneously. We knew that that was so in so far that in the old days, before the Schmidt treatment was introduced, a number of cases did recover spontaneously, or, at any rate, " in spite of treatment." But it did not follow that because milk secretion was entirely arrested, the interchange of calcium from blood to milk was also arrested. Cases clinically identical with milk fever occurred before calving and at any period during lactation. While it might be difficult to explain these on the grounds that there was a sudden withdrawal of calcium, it was to be remembered that calcium metabolism was governed by endocrine factors. While the parathyroid secretion conserved the level of calcium in the blood, other internal secretions, especially that of the ovary, tended to bring about a marked drop in the calcium concentration. Sudden metabolic upsets, involving endocrine imbalances, could therefore presumably bring about acute calcium deficiency. They saw that well represented in the occurrence of milk fever in cows during œstrum, a period in which the internal ovarian secretion was hyper-active. There was little doubt, too, that acute calcium deficiency with symptoms identical with those of milk fever occurred in bullocks (so-called " Staggers "), and it was becoming increasingly apparent that many of these conditions could respond in the most dramatic way to the injection of calcium gluconate.

Mr. Campbell believed that mammary inflation did not merely mechanically arrest milk secretion, but brought about some stimulation or shock which affected calcium metabolism and produced a calcium rise. They had considered the possibility that mammary inflation might also produce an outpouring of mammary endocrine which had that effect, but they had yet no experimental evidence to confirm or refute that idea. It was, however, extremely difficult to believe that mammary inflation produced anything in the nature of shock. They might remember that in the first working hypothesis which Dryerre and he had evolved, they suggested the possibility of mammary inflation producing adrenal stimulation. That that was not so, however, had been rather clearly demonstrated by Auger, who showed that following mammary inflation there occurred no rise in blood pressure such as would have followed adrenal stimulation.

In replying to Mr. May, Professor Greig said that he had not known of calcium treatment being applied in cases of depressed bowel peristalsis such as Mr. May described. He took it that in suspecting the condition to be associated with hypocalcæmia, he rendered the bowels acid with the view of obtaining a more rapid absorption of calcium. The administration of acid, too, would reduce any alkalosis which was present, and so render the calcium more readily ionised and assimilable.

He was interested to hear of Mr. Begg's experience of the calcium treatment proving successful in so-called " Staggers " in cattle and dry cows.

The name " Staggers " had been applied as a generic term with reference to what he believed were a number of entities of similar clinical manifestation. That a number of these conditions represented cases of acute hypocalcæmia was evidenced in the fact that they rapidly and completely responded to calcium injection.

In connection with this he mentioned that it had recently been shown that eclampsia in the sow and in the bitch also yielded quickly to calcium treatment.

It would, therefore, appear that we had discovered and were discovering quite a number of diseased conditions in domestic animals which represented acute calcium deficiencies, and it seemed possible that a new field in veterinary therapeutics was being opened up.

It had long been recognised that the name " Milk Fever " was a misnomer. Many names had from time to time been suggested, but he would suggest the name "Acute Parturient Hypocalcæmia " as the most appropriate one.

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A vote of thanks to Professor Greig and Dr. Dryerre was moved by Professor Robb, and carried with enthusiasm.

Professor Greig, in acknowledgment, observed that he

The North of Ireland Veterinary Medical Association.*

Demonstrations at Stormont.

The Summer Meeting of the above Association was held at Stormont Research Station (by kind permission of the Ministry of Agriculture and Captain Rice, Head of the Animal Diseases Division) on September 17th, 1930, at 2.15 p.m.

The following members and visitors were present:—

Members: W. S. Lamont, J. Kernohan, J. Gault, A. P. Logan, Captain Gregg, A. Snodgrass, Major Williamson, Captain Munro, A. M. Crichton, W. Henry, Captain Crichton, W. C. M. Smith, Captain Rice, A. M'Farlane, J. W. Morrow, H. D. Gilmore, J. Devlin, W. J. Clark, J. A. Bradley, G. W. Jones, F. W. Huey, S. G. Stewart, F. Russell, R. W. Cassells, A. M. M'Lean, H. G. Lamont, R. E. Johnston, and J. I. Magowan (Hon. Secretary).

Visitors: J. Kellett (Newtownstewart), J. Camac (Dervock), W. Dunlop (Cloughmills), D. M. M'Kinney (Ballymena), J. F. Timoney (Animal Diseases Division), R. M'Donnell (Ballycastle), J. M'Ildowney (Veterinary College, Dublin), E. Mangrulkar (Royal (Dick) Veterinary College, Edinburgh).

The minutes of the previous meeting were not read, as the lengthy agenda before the members necessitated all the time and light available.

Demonstrations.

The first item on the agenda was a demonstration of the sterility operation and method of taking blood sample for the agglutination test, by Mr. H. G. Lamont, M.Sc., M.R.C.V.S.

Iodine Injection for Sterility.—Explaining the method of examination, Mr. Lamont said that if any difficulty was experienced in locating the uterine horns and ovaries *per rectum*, it was a useful guide to insert the other hand and arm carefully into the vagina and grasp the *os*, if possible, with the fingers. It was quite a simple matter then to locate the *os*, using the one hand to guide the other. The body and horns could then be felt and the presence of any accumulated discharge or ovarian abnormality noted.

In performing the actual operation, Mr. Lamont remarked that while it was possibly desirable to insert the catheter into each horn, it was not absolutely necessary, as he had found from experience that both uterine horns filled equally from the body provided a sufficient quantity of iodine solution was injected, Mr. Lamont observed that he usually used about 300 c.c., and in withdrawing the catheter he carefully flushed the *os* and, in so doing, usually washed out a piece of catarrhal discharge (this was actually done at the demonstration). The *os* was then swabbed with Tr. iodine and the vaginal passage irrigated with 1/500 iodine.

The strength of the iodine solution injected was 1/500 (Iodine 1, Pot. iod. 2, Aqua. dist. 500). The quantity introduced into the uterus varied with the size of that organ, but 300 c.c. was a fairly average quantity.

Blood Sample Collection for Agglutination Testing.—Mr. Lamont then demonstrated the method of collecting blood samples for the agglutination test for contagious bovine abortion, etc. In giving this demonstration, Mr. Lamont remarked that a good many blood samples were sent in for testing, which, on account of hæmolysis, putrefaction, etc., were not suitable. The technique demonstrated was as follows: The jugular vein was tensed with a fine neck rope held by an attendant; a small area of skin over the vein was clipped and touched with Tr. iodine: with a sharp jerk, Mr. Lamont inserted No. 1 serum needle into the vein and collected the blood in a small glass tube, which, Mr. Lamont remarked, could be obtained free of charge from the Ministry of Agriculture, Northern Ireland, for the purpose.

It was only necessary to half fill the tube and, on being corked and returned to its wooden container, the tube should be left lying flat until clotting occurred. The demonstrator said, further, that occasionally the needle did not penetrate the vein, especially if it were not sufficiently tensed; it was, however, a simple matter to locate the vein and, being already through the skin, another push introduced the needle into the vein. The whole operation only lasted a few seconds.

A member asked what was the percentage of success obtained with Neilsen's operation. Mr. Lamont replied that the Animal Diseases Division had compiled statistics of 800 cases with a percentage of success of approximately 75 per cent. These figures were obtained from various veterinary surgeons. The lowest figure recorded was 60 per cent. and the highest 90 per cent.

Use of the Stomach Tube.—Following on Mr. Lamont's demonstration, Mr. Snodgrass, Strabane, gave a demonstration of the use of the stomach tube in the horse and cow. He explained to members the method of introduction and the many uses of the tube, advising all practitioners who had not adopted this useful method of administering medicine to do so at once, intimating that the best way to learn to use the tube and pump was to buy one and start. He advocated the "Eclipse" pump, as recommended to him by Mr. Chambers, to whom he was greatly indebted for encouragement and helpful advice when he first set out to make use of this instrument.

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would take the opportunity of pointing out that, although the Moredun Research Institute was situated in the county of Midlothian, it was no more a Midlothian institute than was the Bank of England a Middlesex institute. The importance and scope of the Moredun Institute were national, and he welcomed the opportunity of getting into direct touch with practitioners in the Glasgow and West of Scotland area. They would readily appreciate that the investigations at Moredun were in many cases almost entirely dependent upon the support of practitioners. He would like every practitioner in Scotland to regard himself as one of a team of research workers whose lives were devoted to the advancement of veterinary science.

He welcomed the inclusion of Dr. Dryerre's name in that vote of thanks, because in the achievement of such results as they had obtained in milk fever, Dr. Dryerre and he were inseparably related.

Donald Campbell, *Secretary*.

* Received for publication December 22nd, 1930.

A demonstration and talk on the technique of the use of the stomach tube in the sow was next given by Mr. W. S. Lamont, Cookstown.

"Avertin" Anæsthesia.—Mr. A. M'Lean demonstrated to members the operation of ovariotomy in the cat, under "Avertin" anæsthesia. Commenting on "Avertin" and its uses, Mr. M'Lean said this new basal anæsthetic was discovered in Germany in the year 1926 and was introduced into human practice by Professor Richlez.

"It is only in its experimental stage in veterinary practice," said the demonstrator, "and those of us who are interested in feline practice are deeply indebted to Professor Wright of the Royal Veterinary College, London, for the pioneer work he has done.

"I find the dose recommended by Professor Wright to be quite satisfactory; young animals in some cases may tolerate a little more, but with adult animals my advice is, do not exceed the scale of doses laid down by Professor Wright.

"It is not necessary to empty the bowel before injecting the fluid into the colon. The dose for a cat, according to Professor Wright, is ·3 c.c. per kilogram. This cat is eight lbs. weight and will receive 1 c.c. in three per cent. solution distilled water." The hind quarters of the cat were raised and a No. 9 catheter was inserted into the rectum for about six inches and the fluid slowly injected. Deep anæsthesia occurred in about three minutes. The operation of ovario-hysterectomy was performed on this cat. The patient slept for about 24 hours after the operation and showed no subsequent ill effects.

At 4.30 p.m. the members adjourned to tea, after which, in the absence of the President, Mr. Gault was moved to the Chair.

Obituary.—Mr. Gault intimated that his first duty was a painful one, as he had to propose a vote of condolence to the relations of two members whose death had occurred since their last meeting, namely, Mr. James B. Kyle, Limavady, and Mr. R. Kernohan, Ballymena. The motion was passed in silence, the members standing.

International Veterinary Congress.—The Chairman then called on Captain Rice to give an address entitled "Impressions of the International Congress." Before proceeding, Captain Rice welcomed the members to Stormont on behalf of the Ministry of Agriculture. Referring to the title of his address on the agenda he said it was perhaps somewhat miselading as he only intended to review the work of the Congress in respect of those diseases which more intimately affected the practitioner in these Islands.

His interesting address was followed with much appreciation by all members.

Vote of Thanks.—Mr. Kernohan proposed and Mr. Magowan seconded that the best thanks of the meeting be given to Messrs. M'Lean, H. G. Snodgrass and W. S. Lamont for their interesting demonstrations, and to Captain Rice for his lucid and instructive address. This proposal was carried by prolonged and hearty applause.

Next Meeting.—The Hon. Secretary then brought forward the matter of the venue of the next meeting. Mr. Snodgrass proposed that it be held in Londonderry. After discussion, it was decided that the next meeting be held in Belfast and the succeeding one be held in Londonderry in the month of May, on the invitation of those members residing in the North-West. The Hon. Secretary urged all members to make a special effort to attend this meeting in Derry.

Nominations.—The following gentlemen were nominated for membership of the Association: Mr. D. M'Kinney (Ballymena), Mr. W. Dunlop (Cloughmills), and Mr. J. Camac (Dervock).

Operation for Constricted Teat Sphincter.

The members then gathered for the final item on the agenda, performance of the teat operation, by Mr. A. M'Lean, who, while demonstrating the operation and instruments used by him in various surgical conditions of the teats, said: "I do not for one moment claim that the two-bladed knife which I use is a panacea for all stiff milkers, but I do believe that this knife gives the best results where it is necessary to sever the sphincter muscle of the teat canal in order to draw milk with ease.

"The operation is indicated in hard milkers following contraction of the sphincter muscle, or thickening at the point of the teat, the result of inflammation. It is also the ideal line of treatment for the condition known here as "black spot" at the point of the teat. This really is the result of a bruise with the blood clot between the skin and the circular muscle, the skin being intact. The milker has to remove the little spot each time before milking and this interference usually leads to mastitis.

"*Procedure.*—The operation is done in the standing position, the cow being held with bulldogs and the two hind legs tied above the hocks. Clean the affected teat with any of the usual antiseptics. I am using Spirits vini meth. Grasp the affected teat between the thumb and index finger of the left hand. Now insert the little director, at the point of the knife, into the teat canal and with a sudden thrust push the blade through the sphincter muscle; give it a quarter turn and withdraw the knife and the operation is complete, the sphincter muscle being cut at right angles in four places. There is slight spraying of milk for a few days after the operation, but this disappears.

"In dealing with 'black spot,' just operate as if the subject were a stiff milker. The after treatment is *nil*; in some it may be a little difficult to start the milk the following morning, but this is easily overcome by simply rolling the point of the teat between the finger and thumb.

"I believe this operation is superior to that recommended by Mr. Stinson, for the following reasons:—

(*a*) The wound is much smaller.
(*b*) No after treatment is required.
(*c*) The owner is less likely to imitate.
(*d*) Less pain is caused.

"Only operate when the animal is in full milk."

Mr. M'Lean's demonstration concluded one of the most enjoyable and instructive meetings in the history of the Association.

J. I. Magowan, *Hon. Secretary.*

Lord Woolavington (James Buchanan of other days) whose name appeared in the New Year Honours List, was created a baronet in 1920, a peer in 1922, and now, in 1931, he is given the G.C.V.O., for eminent services to the State. He gives lavishly to interests connected with agriculture. Lord Woolavington has twice won the Derby.

University of London Animal Welfare Society.

Humane Education in Schools.

At a meeting held at the Conference of Educational Associations, University College, on January 12th, 1931, the Chairman (Principal Frederick T. G. Hobday) in opening a discussion on the above subject, said: The subject of "Humane Education in Schools" is one which is always exceedingly popular as a headline, but one which needs to be handled a little carefully if one is going to get the greatest good out of it for those whom it is intended to impress. This is well recognised by those who are responsible for the policy advocated by the University of London Animal Welfare Society which, whilst fully recognising that under certain conditions it is necessary that animals must be destroyed, strives to discover and then to teach by propaganda and practical illustrations, the most painless way of accomplishing that end.

This Society, to whose energetic Secretary, Captain Hume, the Members owe so much, is especially fortunate in the fact that the domain in which it works and from which it obtains its recruits, consists of intelligent workers, many of whom ultimately become afterwards not only teachers of the young but leaders of thought in their respective districts and deep thinkers themselves: in other words, they become propagandists for the subject of our discussion here this evening "Humane Education in Schools."

True humanity needs many such teachers—teachers who will teach with common sense, recognising that it is not true humanity to allow, for example, rabbits, rats, and vermin to do their fell work in destroying food which is needed for man or in spreading disease from one district to another, without intervention on the part of man to try to prevent it, but that in encompassing any destruction which is a necessity, it is the duty of man to use his superior brain power in the most painless method possible.

The rat and the rabbit are as apt and good examples as one can find in this country of subject matter upon which the would-be humanitarian can exercise his thought, for perfection in methods of destruction or capturing either of these varieties where they exist in excessive numbers has yet to be devised. To destroy them is legitimate, but to give them prolonged agonising pain, such as they get from certain poisons or viruses, or from the use of steel traps, is not fair even to a rat, and for reasons like this the teaching of humanity to animals, in schools, is likely to bear good fruit by moulding the young and receptive mind of the child in this direction.

The destruction of animals for food purposes, too, is another illustration, for how few people in England give a second's thought as to whether the animal whose flesh they are eating daily died painlessly, or whether the end was an agonising one—and moreover, an agony which could have been avoided—and is avoided in other countries.

This is where we in England are inclined (I think thoughtlessly) to fall into error and compare ourselves with the people of other countries as being "the salt of the earth," as regards humanity towards the dumb creatures who are so dependent on us.

In the question of the painless destruction of animals for food purposes we are 50 years behind such countries as Holland and Switzerland, where, by law, all animals are compulsorily "stunned to insensibility" before the knife is permitted to be applied to the throat. If Holland can do this—and Dutch people, who are great meat eaters, look sturdy and well on the flesh which is produced under these laws and regulations—surely England can do it too; and it only needs that this point of humane education shall be taken from the school to the home and then insisted upon by the housewife, who shall refuse to buy any meat from animals which have not been humanely killed, to give the exercise of humanity, which is their moral right, towards hundreds of thousands of cattle, sheep and pigs annually in this country alone.

It is a national disgrace that we lag behind. Even in regard to the actual killer, the man who administers the *coup-de-grace*, England is far behind such countries as Germany and Holland, in each of which no one but a specially trained and specially certificated man is allowed to give the death blow.

It is to make comparisons, and to explain the reasons why, that the University of London Animal Welfare Society exists. Its scope is boundless and its aims and objects are summarised by the old adage that "a righteous man is merciful to his beast." To preach this to the young University student is like throwing a stone into a pond; one never knows how far the rings will spread, and how far that influence will extend, and wherever it does extend it carries on the good work which repeats itself again and again.

Captain C. W. Hume, Hon. Secretary to the University of London Animal Welfare Society, in his remarks, dealt with "Some Aims of Humane Education." In the course of his address, Captain Hume said that his part was to outline a few of the evils which would disappear if we succeeded in making the coming generation more humane than that to which we ourselves belonged.

Wanton cruelty was the least of the evils with which they had to deal, but it occurred still. The R.S.P.C.A. obtained 2,624 convictions in 1929 and issued 21,630 warnings. The following are examples of wanton cruelty for which convictions were obtained: A man was convicted at Old Street of beating a horse till he drew blood; another at Darlington of burning a rat alive in a bonfire, and another at Plymouth of throwing petrol over two dogs and setting light to them. Wanton cruelty of that kind formed an almost negligible fraction of the whole, but, considered absolutely, it was important, and the teacher was better qualified to deal with it than anyone else.

A far larger amount of cruelty was caused by want of proper care of stock and pets, arising either from ignorance or from indifference. The convictions for cruelty which he had mentioned included many instances of neglect; for instance, at Chesterfield a man received a month's hard labour for starving two goats to death; at Eastbourne a woman was fined £4 for allowing a cat to develop sarcoptic mange until its eyes had nearly disappeared. It was in instruction as to the proper care of pets that the teacher could exert his influence most effectively, but for this purpose he must himself be well-informed. He would like to urge most strongly that teachers should seek the help of veterinary surgeons in this matter; he was certain that it would always be readily given. He would urge teachers who desired to give humane instruction to establish contact with some veterinary surgeon and to consult him regularly.

Help could be obtained also from the R.S.P.C.A., which issued excellent pamphlets; from the Tail-Waggers' Club, the Young Farmers' Club, at the Ministry of Agriculture, and (in the case of rare or exceptional pets) from the Zoological Gardens. It was necessary, however, to issue a strong warning against eccentric animal-lovers who proffered technical advice and treatment without being properly qualified to do so. There had been a craze in recent years for that well-meant but harmful kind of quackery. He would particularly emphasise the fact that the R.S.P.C.A. was prepared to pay any professional fees which might be necessary in the case of animals belonging to poor children.

With children's pets the greatest danger was that the children might forget to feed and water them, especially in the case of caged pets like rabbits, birds and white mice. By inculcating regularity in this respect teachers could prevent a great deal of present suffering, and could build up in their pupils a character in which thoughtfulness for others was a prominent trait.

On the Continent, cruel sports such as bull-fighting, cock-throwing and the like were among the worst abuses. The subject of animal performances had received much publicity. A Committee of the House of Commons recently examined this question and made seven recommendations for the prevention of abuses. Of these recommendations, only three had been embodied in legislation, in a diluted form. Most teachers considered that form of entertainment undesirable for children.

The greatest and worst of all cruelties, however, were those which were rooted in commerce and economic convenience; beside those, all others sank into comparative insignificance. It was just 162 years since attention was first called to the suffering inflicted in the slaughterhouse, and for the past half-century there had been an intensive campaign for the enforcement of humane slaughter. So strong, however, had been the opposition that not until 1928 was the Slaughter of Animals (Scotland) Act passed, while the Bill for England passed its second reading only last month.

In this matter, the public demand for what was right and just had prevailed over the prejudice of the vested interests concerned. But what had the teachers been doing that it took so long to rouse the public conscience?

Before and shortly after the War, large numbers of decrepit horses were exported to the Continent in circumstances of great cruelty; the late Miss A. F. M. Cole was responsible for the repression of the worst features of this traffic. Some confusion existed in the public mind as to the present state of affairs. It was true that horses were still being exported for butchery and thus were being exposed unnecessarily to the rigours of a sea-voyage. It would be better if they could be slaughtered on this side of the water. It was no longer true, however, that these horses were decrepit. The expression "worn-out horse traffic" was now a misnomer and should be replaced by "export of horses for butchery." It was most important that in speaking for animals they should not say a word more than what was rigorously true.

Large numbers of sea-birds died a cruel death through the oil-waste discharged from oil-burning ships. British and American ship-owners had gone far towards fitting their vessels with the separators necessary to prevent this evil, but foreigners had not shown so much goodwill in the matter. It was essentially one with which the League of Nations might deal, in the first place by issuing a questionnaire to the constituent nations and publishing the comparative facts; this would put the backward nations to shame, as a first step in preparation for executive action.

The greatest and most horrible of all cruelties lay, however, in the current methods of trapping and poisoning wild animals. It was, of course, necessary that rats, mice, rabbits and squirrels should be killed; but it was not necessary that they should be killed in a cruel way. Dr. A. H. B. Kirkman, the trapping expert of their Society, had been able to prove that humane methods—and especially the long net—were adequate to keep down rabbits to any desired extent. Yet the use of the steel trap and of the almost equally cruel snare went on unchecked, and the majority of professed animal-lovers were quite indifferent to it. The sentimentalists who financed the animal movement were horrified if lap-dogs went short of chicken-broth and hot-water bottles, but they were not interested in creatures vulgar enough to live in burrows. According to the leading authority on rat destruction—the late Dr. Mark Hovell—the common poisons caused about three days of extreme agony. Humane methods were available, if somewhat more troublesome.

Captain Hume concluded by passing stringent criticism on the methods of trapping commonly employed in the fur trade.

Mercurochrome in Diseases of the Eye.

The advantages possessed by mercurochrome over silver nitrate and other silver compounds in the treatment of conjunctivitis are referred to in an article by Mr. E. R. Chambers in a recent number of the *British Medical Journal*. He has found the mercury compound less irritating and considers that it cannot damage or stain the cornea even when used over a long period. The method advocated consists in painting the lids with a small piece of wool moistened with a few drops of a 1 or 2 per cent. solution and wound round the end of a probe. In corneal affections, blepharitis, and as a preliminary to eye operations, mercurochrome appears to have distinct value.—*Pharmaceutical Journal.*

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Jan. 19th.—Meeting of the Editorial Committee, N.V.M.A., at 2 Verulam Buildings, Gray's Inn, 4.30 p.m.

Jan. 20th.—R.C.V.S., Special Meeting of Council.
R.C.V.S., Committee Meetings.

Jan. 21st.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool.

Jan. 28th.—Annual Meeting of the Scottish Metropolitan Division, N.V.M.A., at Edinburgh.

Jan. 30th.—R.C.V.S., Council Election. Issue of Foreign Voting Papers.

Jan. 30th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds.

Personal.

Mr. L. W. Wynn Lloyd leaves Caernarvon for Conway.—"In the departure of Mr. L. W. Wynn Lloyd, the well-known veterinary surgeon, from Caernarvon, to practice in the district radiating from Conway, the town of Caernarvon suffers a loss which is also the cause of much regret to a considerable circle of personal friends," says the *North Wales Chronicle* of January 2nd. "Mr. Wynn Lloyd has for some years been engaged in a very extensive practice, holding the Ministry of Agriculture and County Council appointments in these northern counties, and has also served on many public bodies. He has been the deputy-mayor of Caernarvon for two years; chairman of the Health Committee, Ferry and Bridge Committee, Combined Sanitary Authority, Boy Scout Association, and the Royal Welsh Show Committees; a member of the County School Governing Body, Infant School Managers, and is one of the Caernarvon Harbour Trustees. He is a Fellow of the Royal College of Veterinary Surgeons. He is also a justice of the peace at Caernarvon. It would appear that Caernarvon's loss is going to be a gain for the Borough of Conway, as Mr. Wynn Lloyd will in future make his headquarters at Danebank, Deganwy, from which residence he will be carrying out the duties arising from his various appointments. Mrs. Wynn Lloyd is a daughter of Alderman J. R. Pritchard, J.P., of Caernarvon.

* * *

Mr. J. Chalmers, Government Veterinary Officer in charge of the Witwatersrand, has resigned his position, having accepted an appointment offered him by the Chief Veterinary Officer of Bechuanaland, on behalf of Northern Rhodesia, Bechuanaland, and Swaziland, as Veterinary Officer to supervise the quarantine of cattle reconsigned from the Johannesburg abattoirs to approved beef abattoirs.

R.C.V.S. Obituary.

Bennett, James Henry, 14, The Grove, Upminster, Romford. Graduated April 26th, 1869, London. Died January 5th, 1931, aged 80 years.

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Mr. J. G. Parr, F.R.C.V.S.

The Leicester Mail of January 6th states:—"A veterinary surgeon for 40 years, and one of the best known members of his profession in Leicestershire, Mr. John George Parr died at his home in Clarendon Park Road, Leicester, to-day.

"He was Veterinary Inspector to the Ministry of Agriculture and Fisheries, and chief Veterinary Officer to the Leicestershire County Council up to the time of his death.

" Up to two years ago Mr. Parr was hon. veterinary surgeon to the Leicestershire Racecourse Company, and a familiar figure at all the meetings. Among hunting people he will be remembered for his association with the Quorn and Fernie Hunts.

" One of his sons, Major F. S. Parr, is well-known in Leicestershire Territorial circles. He served with the 4th Leicester Battalion during the Great War.

" Mr. Parr leaves a widow, two sons, and one daughter."

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THE LATE MAJOR R. PORTEOUS, M.R.C.V.S.

Concerning the late Major R. Porteous, of Southsea, whose death was recorded in our last issue, a correspondent writes :—

" The career of Major Porteous was one long and brave endeavour to carry on in spite of ill-health.

" Early in 1900 he went to the South African War and soon received a commission in the R.A.V.C. After serving there some time, he was posted to India and in 1903 (December) accepted a special appointment in West Africa under the Colonial Office. Although his headquarters were at Jungaru his work caused him to penetrate inland almost as far as Lake Chad, when at times he did not see a white man for three or four months. Owing to severe malaria he was invalided home in August, 1907, being unable to finish his tour of four years. Major Porteous was next sent to Aldershot and Shorncliffe, until December, 1911. On January 1st, 1912, he sailed for India and remained there till March, 1914, when he was invalided home on six months leave with heart trouble and malaria. He recovered sufficiently to enter the Great War in November, 1914, and served in France and Italy till April, 1919.

In August, 1919, he was sent out to Mesopotamia and served at Basra and Baghdad, but was invalided home in May, 1921.

" Major Porteous then retired and bought a practice in Southsea in September, 1921, and was there until his death in December, 1930. He built up a splendid practice, being most popular and loved by everyone, and he held many good appointments and contracts.

" He was a prominent member of the Royal Albert Yacht Club, the Southsea Rotary Club and the Chamber of Commerce, while he also belonged to several Masonic Lodges. He was most popular with his many Army and Navy friends and recently held an Army appointment.

" I may say that be had a high appreciation and an affection for the *Veterinary Record*; indeed, it was the one thing he looked forward to receiving every Saturday morning.

" In 1907 (December) he married Miss Annie Crawford, daughter of the late Robert Crawford, Esq., of Westfield Maybole, Scotland. There is no family."

Tuberculosis the Black Spot.

" That the county is free from contagious diseases, with the exception of tuberculosis, was the report of the Veterinary Inspector (Mr. A. J. S. Reynolds) at the Contagious Diseases Committee meeting on Saturday," says the *Pembrokeshire Telegraph* of January 8th. " Mr. Reynolds emphasised the necessity of obtaining statistics showing the number of bovines affected by tuberculosis in the country. At least one European country was making headway in eliminating this disease so that they would be able to sell butter free from tuberculosis.

" It was decided, on the motion of Sir Geo. Bowen, to find out what precaution other counties were taking in this respect."

Erratum.—In the abstract (*Veterinary Record*, November 8th, 1930, p. 1020) of an article " Contribution to the Study of Stomachal Indigestion in the Pig; Treatment by Pilocarpine," by H. Aubian (*Rev. Vet.*, 1930, 82, pp. 310-315), a slip *re* dosage was made in paragraph 4. It should read : " In a 100 kilo. subject a dose of 2 centigr. is often insufficient. With 4 or 5 centigr. the effect is more regular. Finally, with 6 or 7 centigr. a certain result is got, the patient neither appearing very upset prior to vomition, nor fatigued after treatment. The same applies to an adult sow with a dose of 10 centigr."

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Victoria Veterinary Benevolent Fund.

TO THE EDITOR OF THE VETERINARY RECORD.

" THE HAPPY ENDING."

Sir,—May I again trespass on your generosity for a small space in which to express my very grateful thanks to all those who so kindly and generously supported me with the above production, either by giving donations, taking seats, or by their personal efforts on and off the stage and in many ways too numerous to mention.

If those ladies and gentlemen who have collecting cards in their possession will kindly return them to me at once, I shall hope to publish the financial result in about a fortnight's time.

Lastly, may I express my deep appreciation to the *Veterinary Record* for all the voluntary and valuable help given to me in the way of advertisement and publicity.

I am,

Yours truly,

P. J. SIMPSON.

Shirley,
Maidenhead.
January 13th, 1931.

" Query."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—A.B. is an M.R.C.V.S. and a general practitioner in a large city *which has its own whole-time veterinary staff to carry out regulations under the D. of A.A.*

In the event of A.B. being asked by his clients *within the boundaries of the city* to investigate on their behalf :—

(1) A bovine dying without apparent cause;
(2) Pigs ill and one dead;
(3) Sheep showing evidence of broken fleece;
(4) Horse showing evidence of falling out of hair;
(5) Horse unthrifty, showing corded lymphatics;
(6) A milch cow having an abnormal udder

Is the practitioner entitled (in order to carry out reasonable steps on behalf of his clients and to safeguard himself against the possibility of a scheduled disease being the cause of the deaths, or illness or enlargement of the udder) to carry out the following :—

(1) To take a blood sample from the dead bovine for microscopical examination;

(2) To make a *post-mortem* examination upon the dead pig;

(3) To take scrapings from the sheep;
(4) To take scrapings from the horse's skin;
(5) To apply the mallein test;

(6) To take milk or secretion sample from the cow's udder for microscopical examination.

Provided that in the event of any of the investigations proving that a scheduled disease is present and that he reports his findings with all practicable speed to the Local Authority, has he committed a breach of the regulations governing the administration of the Diseases of Animals Acts?

N.B.—A.B. holds no appointment as local veterinary inspector; he is merely a qualified veterinary surgeon in general practice.

Yours faithfully,

C. ELPHICK.

67 Newgate Street,
Newcastle-on-Tyne.
January 10th, 1931.

The Editor acknowledges the receipt of the following :—Report of a meeting of the Lancashire Division, N.V.M.A., from Captain J. Spruell, Hon. Secretary. Report of a meeting of the Scottish Metropolitan Division, from Mr. W. C. Miller, Hon. Secretary.

Communications from Mr. J. J. Davies (London), Dr. J. McCunn (London), Mr. G. B. Purvis (Federated Malay States), Mr. J. B. White (Salisbury) and Lieut.-Colonel T. Dunlop Young (London).